ELECTRICAL REVIEW

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In This Issue

47 PRODUCTION AND EXPORT
49 NEW FIRE STATION
51 SPEEDING UP TILE PRODUCTION
52 TRAINING ILLUMINATING ENGINEERS
53 SELENIUM SUPPLIES
55 ENGINEERING IN EUROPE
56 AYCLIFFE NEW TOWN
60 NEW ELECTRICAL EQUIPMENT
61 VIEWS ON THE NEWS
62 NEW YEAR HONOURS
63 PERSONAL AND SOCIAL
68 INDUSTRIAL NEWS
71 ELECTRICAL ACCIDENTS
72 THE 1954 POWER CONVENTION
74 FARMING IN SOUTHERN RHODESIA
77 SHOE MANUFACTURE
80 GENERATION AND DEVELOPMENT
82 FINANCIAL SECTION
85 ELECTRICAL MANUFACTURING—1953
86 NEXT WEEK'S EVENTS
87 NEW PATENTS
89 CONTRACT INFORMATION
119 CLASSIFIED ADVERTISEMENTS
130 INDEX TO ADVERTISERS

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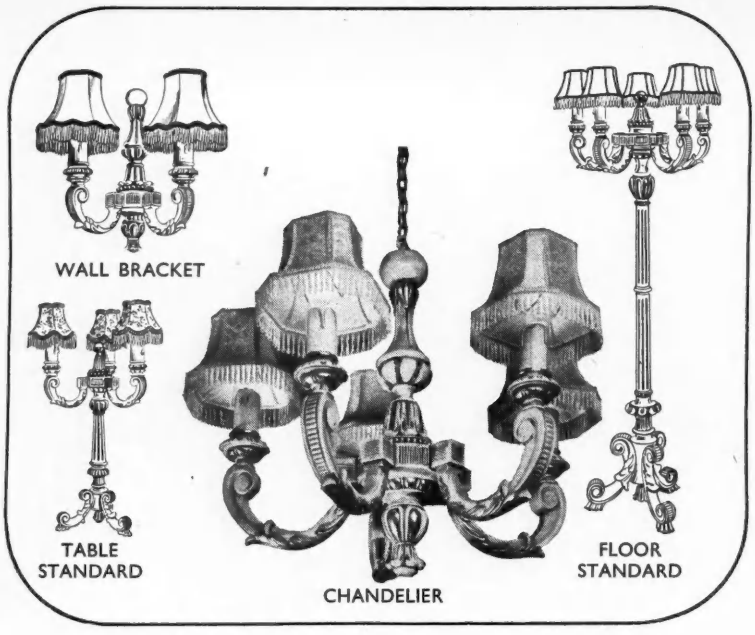

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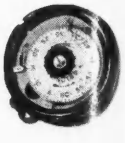

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Production and Export

UPON the whole the electrical manufacturing industry appears to have done well during 1953, although recently there have been cautious references by some company chairmen to less extended order books. This may reflect a clearance of arrears of work, bringing with it the prospect of quicker delivery which is desirable from the competitive point of view. It does mean, however, that active salesmanship backed by attractive products and prices is more than ever necessary.

Employment in the various branches of the electrical manufacturing industry remained steady during the past year. At the end of October the labour force in electrical machinery manufacture was 175,700, practically the same as a year earlier. In the cable and wire branch, however, there was a decline from 62,700 to 58,900 and in the telephone and telegraph apparatus group a fall of about 3,000 to 52,100. There was a small improvement in the battery and accumulator branch—to 19,900, but the principal rise occurred in the radio and gramophone industry—from 99,300 to 114,600. There was also a continued upward trend in employment under "other electrical goods," probably indicating an improvement in the domestic appliance business.

At home there is a continuing need for the re-equipment and modernization of all industries and in practically every case this means an extended use of electrical plant. The scope in this direction is still enormous and must ever widen so that makers of electrical industrial equipment should find plenty of work. This in itself is a contribution to the country's export trade because only by improved efficiency can our manufacturers hope to compete successfully for overseas contracts. But the electrical industry is also one of the largest direct exporters. In the first eleven months of 1953 electrical goods and apparatus to the value of over £95 million were exported; this was nearly £6 million less than in the corresponding period of 1952 but still more than £6 million above the 1951 figure. Exports of electrical machinery and switchgear were also slightly down as compared with 1952 (£55 million against £56 million) but they were well above the 1951 total of £47 million.

With electrical development going ahead all over the world there is likely to be plenty of work for British electrical manufacturers but competitors are striving for business. Not only have the German electrical concerns revived very rapidly and the Japanese producers become active again, there is also the United States which will endeavour, with strong financial backing, to balance any decline in home business by seeking foreign orders. In these circumstances it is to be hoped that the trade unions will come to a realization of where their members' true interests lie. Higher wages without correspondingly greater effort, and restrictions which slow down production, must mean loss of orders and eventual unemployment.

NEW BULK SUPPLY TARIFF

As foreshadowed in the British Electricity Authority's last report, a major revision has been made in the bulk supply tariff for 1954–55, details of which are given on page 76. Inevitably, because of higher costs, there is an overall increase, but under the altered structure the effect will vary, the terms being particularly designed to favour high load factors. The fixed charge bears the whole of the increase, being advanced from £4 5s 6d to £4 15s per kW of maximum demand; this follows an increase last year of 3s. A concession now introduced is that there is to be no additional charge where the demand at night or at the week-end (after midday on Saturday) exceeds the normal peak period demand. Area Boards will thus be able to develop their off-peak loads without fear of incurring additional fixed charges. The running charge is now to be calculated on a basic coal cost figure of 60s a ton instead of the unrealistic one of 38s used hitherto. With the present coal clause factor of 0·0007d per penny variation in the cost of fuel a straight conversion from the existing basic running charge of 0·33d/kWh gives 0·5148d, so that the new figure of 0·5d represents a reduction. Furthermore, to reflect the improvement in thermal efficiencies since the present rate was introduced, the fuel price adjustment figure in the new tariff has been lowered to 0·00065d. No change has been made in the method of determining the running charge according to the fuel costs at power stations in each Area, irrespective of whether part of the supply is obtained from stations outside which may have lower fuel costs. Last year these costs ranged from 74s 10d a ton in the South Eastern Area to 51s 4d in South Wales.

ENGINEERS' SALARIES

We announced in our issue of 11th December that the Electrical Power Engineers' Association had decided to take "immediate and drastic steps" to improve the status and salaries of its members. Its feeling was that engineers in the service of the British Electricity Authority and Area Boards had been badly treated in comparison with other sections of the electricity supply service having regard to their importance to that service. Now, we hear, an "Action Committee" has been set up to prosecute the claim: it consists of the E.P.E.A. president (Mr. J. Jones), the president-elect (Mr. E. Hanson), a vice-president (Mr. J. Parr-Morley) and the general secretary (Mr. H. Norton). It appears to be the committee's intention to seek direct interviews with Lord Citrine and representatives of the Area Boards before an actual claim is submitted. Dissatisfaction with the operation of the existing negotiating "machinery" has led to this decision.

ELECTRICIANS' WAGES

Last October a Court of Inquiry which investigated the circumstances of the dispute in the electrical contracting industry recommended the two parties to try again to resolve their differences, mentioningthe possibility of arbitration. Since then nothing has been publicly stated, apart from an article in the journal of the Electrical Trades Union in which arbitration was described as a gamble for the workers with the dice heavily loaded against them. But behind the scenes further efforts have been made by the National Federated Electrical Association to end the suspended hostilities. The industry's National Joint Industrial Council has met; the Union has repeated its demand for a "substantial" increase in wages and the N.F.E.A. has suggested reference of the matter to the Minister of Fuel and Power, presumably as a first step to arbitration. Now the Union has written to the N.F.E.A. in terms which are construed as notice of its intention to authorize a repetition of the strikes at selected sites which occurred in August and September. Moreover, it has since announced its intention of calling a 24-hour strike on 18th January. The Ministry has been having discussions with the parties this week in the hope of bringing them together. In spite of what the E.T.U. may think about arbitration it is preferable to a trial of strength which will damage both parties and the public interest and still leave matters unsettled.

PREVENTION OF ACCIDENTS

Portable apparatus, including connections to the supply system, continues to provide by far the greatest group contribution to the number of injuries and fatalities associated with the use of electricity in factories. Means of avoiding these mishaps, whether by transformation to a lower voltage or by special earthing circuits, are outstanding features of "Electrical Accidents," which is reviewed in this issue. In its long-term aspect the note on the training of apprentices who wish to make a career of electrical maintenance, as distinct from acquiring ability to carry out quick repairs, merits consideration by industrial managements. This annual report does much more than collate statistics for the year to which it relates. It also puts forward constructive proposals that should increase safety. It is all the more regrettable that publication should be delayed—in the present instance two years—after experience leading to positive recommendations had been gained.

ELECTROSTATIC PRECIPITATION

The paper and discussion on electrostatic precipitation theory and operation at a recent I.E.E. Supply Section meeting brought to light some problems which may influence the whole question of precipitator design, and the importance of this cannot be overlooked when it has been said that the cost of such plant is the third highest item in the costs of a power station employing precipitators. The value of the suggestion by the author of the paper that pulverized fuel dust was composed largely of two distinct types of particles—one wholly ash and one coke—seemed to be offset in the discussion by the slide representation of a dust particle consisting of a shell of coke containing a white substance. In any case the clash of ideas gives great importance to the announcement that two research installations are being established by the B.E.A. to study the whole question.

New Fire Station

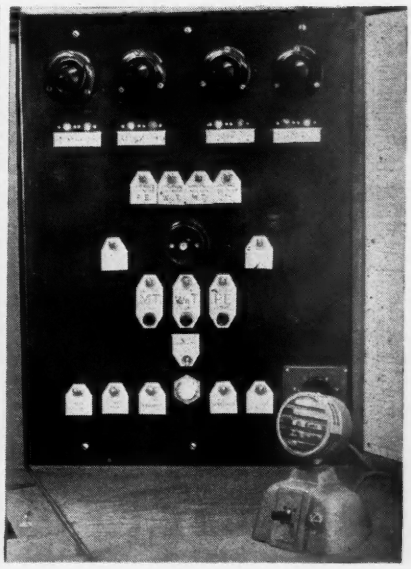
Novel Features of a Monmouthshire Installation

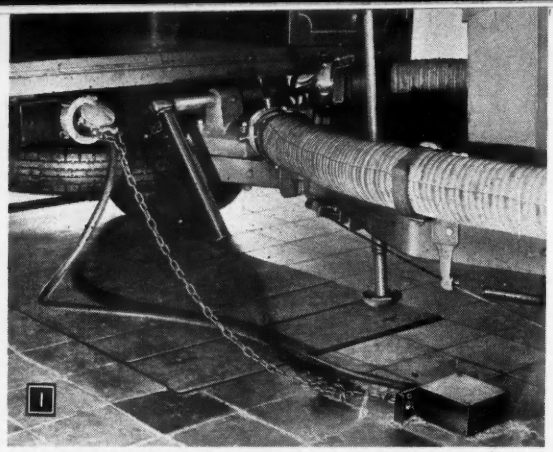
SEVERAL interesting electrical innovations have been introduced into a new fire station just put into service by the Monmouthshire County Council at New Inn. Replacing a station at Pontymoile, Pontypool, the new station is now one of two divisional headquarters operating under the administrative headquarters at Llantarnam. With the other divisional headquarters at Ebbw Vale, it is in immediate touch with the Brigade's seventeen stations.

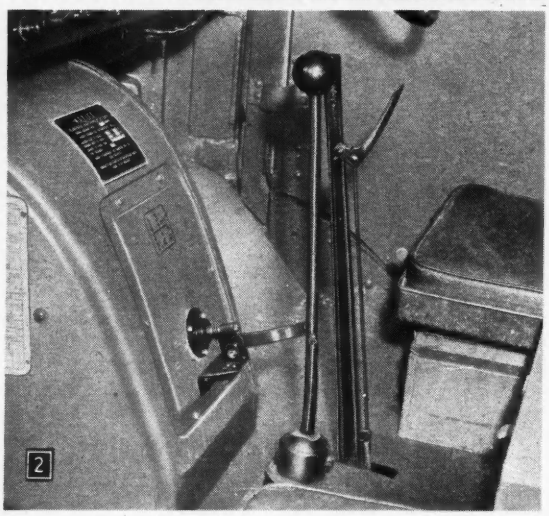
Of particular value in securing maximum efficiency and quick response to fire calls is a control desk which has been specially constructed in the Brigade's own workshop. From this desk, the officer on duty, on receiving a call and after studying an adjacent rotating card type street index system, can by the simple operation of the appropriate push-button and switches immediately turn out the necessary appliances from both the local and sub fire stations.

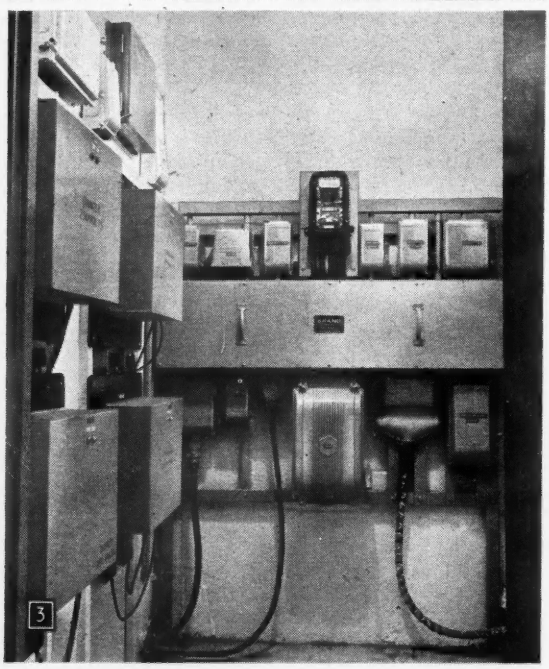
The centre of the three panels surmounting the desk is employed as a normal telephone switchboard with one incoming "fire line," three administrative lines, a direct line to headquarters and six extensions. On the right of this board is another panel at the top of which are four vacuum push-button switches connecting the four retained fire stations (retained stations are normally unmanned and the firemen turn out only on the siren warning), at Blaenavon, Abersychan, Usk and Pontnewydd. Operating under the General Post Office's System C, the lines connected to these stations are used first for operating the sirens and bells in the firemen's houses, and then after 60 seconds for telephone communication. Time switches disconnect the sirens between 11 p.m. and 7 a.m. Faults

The control room of the New Inn fire station and (right) a close-up of the control board









(1) Special nine-pin plugs and sockets are used for connecting up the appliances for radiator heating, battery charging and engine starting

(2) Device inserted between the footboard and the gear lever to prevent the starting of the engine while it is in gear

(3) The switchroom showing the G.P.O. System C equipment on the left

on the line are indicated by red lights and a bell rings in the event of a power failure.

Below the vacuum push-button switches is a row of ordinary tumbler switches for indicating, on an illuminated panel in the adjoining appliance room, which of the appliances are required, the dual-purpose (pump escape) vehicle, the water tender, the major trailer or the Land Rover. Below these again are push-buttons for the siren (Carter) and five wall bells (Gent), the automatic starters for the appliances and the loudspeaker amplifier, with switches for the desk light, the " Fire " sign outside the building, the " Enquiries " sign, the light in the forecourt and alarm lights. At night selected lights can be switched on from the control desk by means of two contactors.

An emergency low voltage lighting scheme with a separate conduit installation is served by a Pritchett & Gold and E.P.S. equipment with a capacity of 375 A for one hour (30 Ah at the 10 hour rate). Because of the compactness of the station and the short runs of cable a 25 V system with 30 W lamps was selected, the lamps being normally arranged in reflector fittings close to the main lighting units. Provision is made for the automatic change-over to emergency lighting on the failure of the mains supply and a local switch is installed in the control room for cutting out the emergency lighting in the daytime.

The main lighting of the appliance room comes from Revo industrial distributing type fittings. Elsewhere prismatic bulkhead units (J. & G. Coughtrie) and 10in plastic fittings (J. S. Peress) are employed, except in the control room where there is a Falk, Stadelmann " Trent " fluorescent unit with a " Perspex " shade.

Special nine-pin plugs and sockets have been supplied by Simmonds & Stokes, Ltd., for connecting up the appliances for radiator heating, battery charging and engine starting. For the radiator heating Bray 250 W elements have been inserted in the water system, while the charging is catered for by a Heayberd charging unit. An ingenious device involving the use of contactors and the insertion of a metal assembly between the footboard and the gear lever when in neutral position makes it impossible to start up the engine if it is in gear.

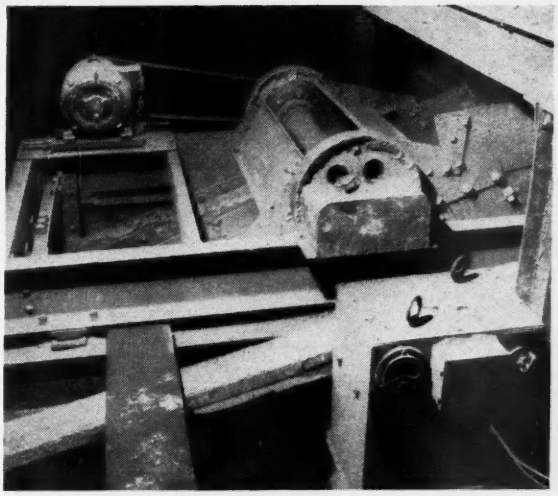
In addition to the 100 A t.p. and n. main switch, the various sub-switches and switch-fuses (Bill) and an " Auto-Memota " contactor for the siren, the switchroom also accommodates, for the sake of accessibility, four panels for the G.P.O. System C apparatus and also the amplifier equipment (Telephone Rentals) for the four loudspeakers installed within the station, plus a 6 W loudspeaker unit in the drill yard. Apart from the Pyrotenax mineral insulated cable installed under the appliance room floor, all the wiring is carried out in conduit, installation being facilitated by the provision of large ducts running almost the full length of the building. The premises are wired throughout for Smiths synchronous electric clocks.

The building is heated by a low-pressure hot water system with floor heating in the appliance bays. The heat source is piped steam from an adjacent gas works through " steam to water " calorifiers. The hot water circulation is assisted by a " Criton " accelerator driven by a ½ h.p. Crompton Parkinson motor. Cooking facilities for the messroom include an English Electric cooker.

The electrical scheme was devised by the Monmouthshire Fire Brigade in conjunction with the Monmouthshire County Architect's Department (Mr. Colin L. Jones, F.R.I.B.A., county architect; Mr. H. Latham, A.M.I.E.E., electrical engineer). The electrical contractors were the Brand Electrical & Engineering Co., Ltd., Newport.

We are grateful to Mr. Cyril Thomas, chief fire officer to the Monmouthshire County Council, and his staff for the help given to us in the preparation of this article.

Speeding Up Tile Production



General view of one of the two vibrator screens, showing the transformer in the bottom right-hand corner

THE Long House Tileries of Henry Hawkins, Ltd., Cannock, occupy a site of 5 acres, where modern production methods contribute to an output of roofing tiles of about half a million every week. For some time a major problem at the works has been the screening of the tile clay after the grinding process. The ground clay was delivered by a conveyor system to the vibrator screens in a damp condition, and after as little as ten minutes continuous operation the wet clay clogged the screen to such a degree that more than fifty per cent of fines were being returned to the grinding plant.

Moreover, the screen had to be cleaned manually with wire brushes—a particularly wearing operation for the cleaner and for the screen. With this cleaning down process necessary every ten minutes during the day, new screens had to be installed each week and considerable production time was lost.

Much effort was expended in attempting to overcome this difficulty and various methods of heating the screens were tried, including the blowing of hot air on to the meshes. A successful solution was finally found by the Woden Transformer Co., Ltd., working in collaboration with the company's engineers. They found that the most satisfactory method of heating the mesh was to pass a heavy electric current through the mesh wires at low voltage.

The current rating depends upon the size and mesh of the screen, the temperature of the clay and its moisture content, and to accommodate these variables a tapped transformer was provided giving six different current ratings.

Single-phase air-cooled Woden transformers were used and they had to be totally enclosed because of the fine clay dust generated by the vibration of the screens. The transformers are rated at 12 kVA, and Class "B" insulation was used because of ventilation difficulties caused by the necessity for total enclosure. An ammeter is connected in the primary circuit and mounted in the transformer case.

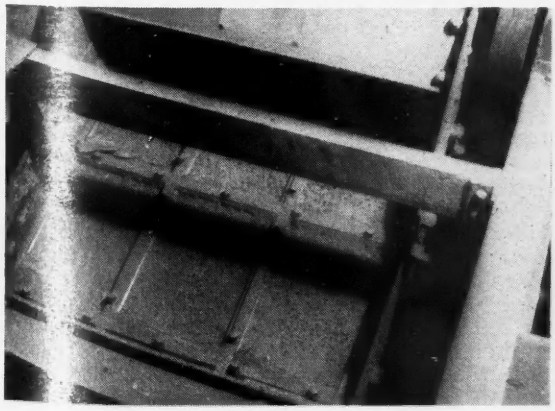
In practice, it was found that the transformer tappings would cater for a range of meshes on any given screen size, and therefore meshes can be changed if required without the need for extra equipment.

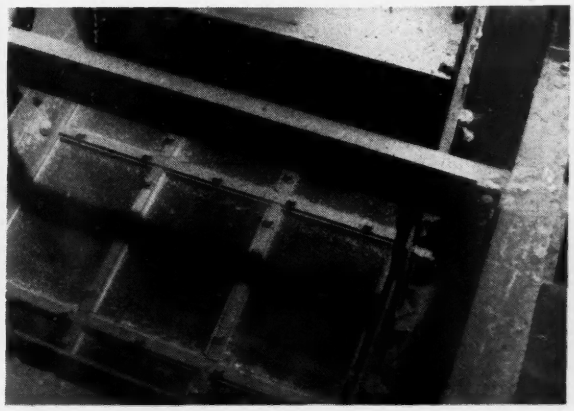
The practical aspect of the installation proved to be a little difficult—mainly in overcoming the hazards of the continued vibration set up by the screens. The mechanical strength of the transformer and its leads had to be more than sufficient to withstand this vibration, and a positive measure of electrical safety had to be guaranteed to the operatives. In addition, the distribution of heat over the screens had to be uniform, with reliable insulation of the meshes.

The installation with electric heating was first put into full production operation in August last and since that time it has not been necessary to replace the screen, and labour for cleaning down has been dispensed with entirely.

The screens now operate continuously, without supervision, and as much as 23 tons of clay per hour is going through them. Production has been increased by more than 25 per cent, and the quality of the tiles has improved. The screen which was started in August is still operating and in good condition. The system is of course applicable to other materials and industries where screening is carried out and difficulties are experienced through moist material blinding the meshes.

On the left the screen heating has been off for about seven minutes and moist clay is gradually blinding the screen. On the right, with screen heating clogging or blinding is prevented





Training Illuminating Engineers

Engineering and Economic Factors

By N. CORCORAN, B.Sc., M.Sc.Tech., B.A.(Com.), A.Inst.P.*

A GROWING number of men are engaged in the preparation of lighting schemes; they are entrusted with the responsibility of deciding on the type of lighting, the intensity, the type and position of the fitting, and the lamp wattage. This is a more exacting responsibility than is generally supposed, and the illuminating engineer should be familiar with all aspects of the work. There is no unique solution of a given problem; both engineering and economic factors must receive consideration, and the final result may depend to a large extent on personal preference.

A lighting scheme may be prepared by a lamp manufacturer, a fittings manufacturer, or an installation contractor, and in many cases the individual responsible has had rather a one-sided experience. He usually knows a great deal about lamps, fittings, or installation, respectively, but has not the same detailed knowledge of the other aspects of the completed scheme. What minimum amount of knowledge, then, is required and how is it best obtained?

The chief, if not the only examination in illuminating engineering alone is that organized by the City and Guilds of London Institute. The course is comprehensive, and the possessor of the final certificate need have little fear of finding himself unable to deal with any normal problem.

Unfortunately, though, facilities for this course are available only in the larger towns, and the illuminating engineer is often thrown entirely on his own resources, coupled with such text-books as can be obtained and a table of coefficients of utilization. It is usually possible to prepare a lighting scheme from this table, but the engineer must understand what he is doing. Customers have an awkward habit of asking supplementary questions, both on the illumination and on the electrical side, and the successful engineer is the one who can give an intelligent answer. It is not sufficient merely to point to a table in a book.

Mounting Height Example

The commonest criticism of a lighting scheme is that the lamps are mounted too high. If a 20ft mounting height is prescribed, so that the fittings may be suspended conveniently from the roof girders, it is almost inevitable that somebody will, at some stage, suggest that the fittings be brought down to 10ft high, thus giving, on the inverse square law, four times the light intensity. This suggestion may come from the sales force of the engineer's own company, from the client, or from the installation contractor.

The engineer should have the explanation ready; he should tactfully explain that in a large room nearly all the light flux from the lamps reaches the working plane directly, and only a small part gets to this plane via the walls. The effect of lowering the lamps therefore is to increase the proportion of light reaching the working plane directly, from say, 98 to 99 per cent, which has a negligible effect on the coefficient of utilization. This explanation, being perfectly simple, satisfies the objector, but the illuminating engineer must know it thoroughly, and not simply say that the book says it makes no difference.

Those whose training has been mainly concerned with lamps are not always fully conversant with the range of fittings available; it would be useful if every lamp specialist were to peruse in detail the whole of a fittings catalogue, in the company of a member of the technical staff of the fittings manufacturer. It would also be instructive to obtain a sample fitting and to take measurements of the temperature of the leads when the lamp has been in operation for some hours; the wise engineer will confine himself to fittings which comply with the I.E.E. Wiring Regulations in this respect.

Choice of Lamps

Fittings experts still occasionally specify clear lamps—although the loss of light in a pearl lamp is only about one half of one per cent, and both clear and pearl lamps are made to the same British Standard. The engineer should not confuse initial illumination with average illumination throughout life, and he should have a good knowledge of the physical principles of operation of metal filament, mercury, sodium, and fluorescent lamps. This calls for a deeper knowledge of pure physics than is possessed by many electrical engineers.

The engineer should also understand the means by which we perceive colours, including Maxwell's three-colour theory of vision. He should have an answer ready to the questioner who asks why two colours appear the same in sunlight and not in filament light. He should be able to avoid such elementary fallacies as the surrounding of mercury vapour lamps by red glass so as to introduce some red into the light, and the attempted deflection of the light from one fitting by light of a different colour from another fitting.

It is not always easy to decide whether mercury vapour or metal filament lamps are most suitable for a given installation. Some engineers play safe and recommend metal filament lamps for all circumstances in which there is moving machinery, so a thorough understanding of the stroboscopic effect is essential. In many cases discharge lighting is quite appropriate even where there is rotating machinery, especially if the lamps are divided between the three phases in a suitable manner, but the best solution cannot be reached without a knowledge of the various lamp characteristics.

On the question of colour, it is not always fully realized that the impression actually received by the eye depends on the reflection factor of the material being examined. Thus, of two installations of the same foot-candle value, a mercury installation would lead to more light entering

*The author is Principal of the Technical College, Radcliffe, Lancs.

the eye if the material being handled were blue, green and yellow, and a metal filament installation would be more efficient optically if the material were red and orange in colour.

The engineer should also know the principles of current electricity, the use of fuses to localize the effects of circuit faults, and the significance of power factor. The author once heard the case for power factor condensers being argued most persuasively by a salesman; without them the power factor was 0·5, with them it could be raised to 0·9, so the salesman finished his argument with: "In other words, you are throwing away half your electric light bill by only operating at 0·5 power factor. By increasing it to 0·9 you save 40 per cent of your power consumption." As it happened, the customer was an electrical engineer, and saw the pitfall which the salesman had not appreciated, but sometimes the engineer has some very awkward explaining to do when wild statements have been made. The engineer should also realize that the power factor of a mercury lamp itself is about 0·92, since even if the voltage waveform is purely sinusoidal, the current waveform is not, and so the two can never fit completely in such a way as to give unity power factor.

Street lighting has a greater variety of problems than interior lighting, mainly because the reflecting properties of the road surface play such an important part in the result. A knowledge of lantern design, isocandle diagrams, Flamsteed's projection, and the laws of reflection and refraction of light is therefore required, since sooner or later a client is going to ask why the glass is ribbed in that particular manner, and the competent illuminating engineer should be able to answer him. In addition, the engineer should observe installations in course of erection, inspect them at night when in operation, and familiarize himself with the various time-switching and remote control systems.

In considering the choice between metal filament and discharge lamps, it is a mistake to conclude that the discharge lamp installation is necessarily the most economical, simply because it is most efficient. The capital cost of the installation must be considered, together with the cost of lamp replacements. The engineer should be able to draw up comprehensive tables of running costs.

It is not the author's purpose to suggest that all practising illumination engineers are insufficiently qualified, but to draw attention to the fact that the necessary all-round training is not attained by taking, say, a lamp expert and expecting him to pick up all that he need know about fittings and installation, simply by the light of nature. If it is not practicable to arrange for the trainee illuminating engineer to study for the City and Guilds Certificate, some other systematic training should be provided. For a company which adopts the policy of stationing illuminating engineers in branch offices, it is a good plan to have a correspondence course—which could be extended to selected salesmen who showed the necessary ability—run either from the head office, or from a branch office, should there be an exceptionally well qualified man there. Some firms have found it advantageous to employ an outside consultant, but the important need is for training in the basic theory of the craft before any serious mistakes have been made in the process of "learning by experience."

Selenium Supplies

Possible New Sources

By A. G. THOMSON

ALTHOUGH most raw materials have become more plentiful of late, selenium remains critically scarce and no improvement in supplies of this essential metal can be foreseen. In the United States of America, the President's Materials Policy Commission's Report—usually referred to as the Paley Report—has stated that selenium stocks are at their lowest level since the metal was first refined on a commercial scale. The gap between supply and demand may tend to widen still further, because there are many applications for selenium which are at present dormant on account of the high cost of the metal. Against the general trend the price advanced early in 1953 from 25s to 30s 6d per lb, this being the figure fixed by arrangement between the British Government and distributors. Users who obtain supplies outside this arrangement have had to pay up to 122s 6d a lb.

The shortage of selenium is due mainly to the advent of radar and television and, in general, to the tremendous expansion of electronics and communications in the electrical industry which has taken place since the war. Because of its unusual property of passing a current in one direction only, selenium is an ideal material for the production of rectifiers, and so far no satisfactory alternatives in the electrical field have been discovered, though it is possible that substitutes might be developed from other photosensitive and semi-conductor materials.

While selenium's most important application is in the manufacture of rectifiers, the metal has many other uses, e.g., in the production of red signal glass and other coloured glassware. The Paley Report states that the glass industry is receiving only 15 per cent of its needs. The best known application for selenium is in the construction of photo-electric cells, but in terms of tonnage consumed this field of use is relatively small, accounting for only about one per cent of the total demand.

A development of interest to the electrical industry is the use of selenium on a small scale for fire-proofing fabrics, wood and other materials. Electric wires and cables can be insulated with the material, and the cotton and rubber protective covering can be impregnated with it. A cable which has been so treated will not continue to burn when removed from a flame and will not catch fire as a result of a short circuit.

Chief Producers

The bulk of the world output of selenium comes from the United States and Canada, which between them produce about 1,000,000 lb a year. No up-to-date statistics are available, but in 1951 the U.S.A. produced 457,004 lb and Canada produced 369,000 lb of the material. The only other producers listed were Sweden (with exports of 90,390 lb), N. Rhodesia (9,772 lb), Finland (3,146 lb)

and Australia (1,924 lb). Although the largest source of selenium, the United States is unable to supply all its own requirements from domestic sources and is also the largest importer of the metal. In 1951 the United States and Britain imported, respectively, 246,552 lb and 191,656 lb, mainly from Canada. Canadian exports during the same year totalled 370,473 lb.

Unfortunately the relationship between supply and demand is complicated by the fact that selenium is essentially a by-product metal. Although native selenium occurs in association with native sulphur and metallic sulphides and the element is also a constituent of many minerals, there is no known occurrence of selenium or its minerals which is sufficiently extensive to be commercially exploited. Small quantities of the element are present in some pyritic ores, and the bulk of the world output is recovered from the " anode slime " formed in the electrolytic refining of copper. Extraction is complicated by the simultaneous production of pure copper, selenium, tellurium, gold and silver, and also by the tremendous variation in the composition of blister copper. For example, Arizona copper has about 0·15 per cent selenium, while the coppers of Eastern Canada contain as much as 0·26 per cent of selenium plus tellurium.

Methods of Recovery

In both the U.S.A. and Britain the outlook for selenium is regarded with concern and considerable attention is being devoted to possible methods of augmenting supplies. The authors of the Paley Report put forward five recommendations which are regarded as well worth consideration. There is first of all the possibility of recovering selenium from smelting operations in plants which are not at present equipped to refine the material; an example is given of a company which does not recover the selenium from its output of 3,000 tons of ore daily, processed but not electrolytically refined.

It is also considered that better recovery in plants now producing selenium could undoubtedly be obtained, although it must be borne in mind that the principal reason for the low recoveries of selenium lies in the fact that the electrolytic copper refining plants are, of course, designed primarily for the most efficient production of copper. According to the report, one of the largest producers in North America is obtaining only about one-third of the selenium present in the ores, the remainder being lost during the smelting operations. By modifying existing equipment and processes, this company alone could increase its output of selenium by about 300,000 lb per year. In considering the development of improved methods of recovering selenium, copper refiners will doubtless be guided primarily by economics, since it is possible that costly new equipment might have to be installed. Hence the price of copper is likely to have an important bearing on future supplies of selenium.

Another possibility is that selenium might be recovered from newly developed copper deposits in the west, which are expected to be in production in the near future.

Selenium "Farming"

Finally, the Paley Report refers to the possibility of selenium " farming." It appears that many areas in the west have seleniferous soils. Plants grown on these soils absorb selenium to such an extent that animals grazing on them are liable to be affected by selenium poisoning. The suggestion is that crops of a suitable type should be grown and harvested, and that they should then be processed to extract the absorbed selenium. By selecting those plants that are best at accumulating selenium, some 20 to 40 lb of selenium per acre could probably be obtained in an ash concentrate. This possibility is regarded as reasonably economic.

Having no copper sulphide ores, Britain is entirely dependent on importation for its requirements of selenium. Nevertheless, the possibility cannot be excluded that the metal might be recovered from the imported iron sulphide (or pyrites) which is now used extensively in the manufacture of sulphuric acid. The flash roasting of pyrites produces concentrations of selenium in wastes, dusts, muds, etc., which are left in certain parts of the plant. Samples of these wastes have been examined at the Chemical Research Laboratory of the D.S.I.R. It is hoped that at least one source may contain enough selenium to justify recovery, and that it may be possible to develop a cheap and simple method which will not interfere with the primary object of the process, namely, the manufacture of sulphur. The potential yield of selenium from this source is placed by the D.S.I.R. investigators at some tons, which would be a very useful supplement to existing supplies.

In a report published last year the Metals Economy Advisory Committee emphasized that the possibility of recovering selenium economically in this country from imported ores should not be excluded without thorough investigation. It is encouraging to find that this recommendation is being vigorously acted upon.

The evidence suggests that adequate supplies of selenium are potentially available to meet present and future demands if recovery of this by-product metal could be extended and improved. The problems are obviously great, but they should not be incapable of solution by the resources of modern technology.

Mechanical Handling Exhibition

THE fourth Mechanical Handling Exhibition and Convention will be held at Olympia, London, from 9th to 19th June next. More than 200 firms will exhibit and the space occupied will exceed 250,000 sq ft, 14,000 more than on the last occasion in 1952. All types of labour aids will be shown and most of them will be seen in operation. They will include pallets, trucks, cranes, aerial ropeways, overhead conveyors, belt conveyors, elevators, wagon tipplers, winches, power units, chains, gears, controls and all other accessories. Many of the exhibits will be of interest to owners of small workshops as well as to manufacturers on a big scale.

Twelve papers will be read and discussed at the Convention, the subjects including work study, bulk handling by transporters, mobile cranes, belt conveyors, aerial ropeways, cargo handling, the economics of industrial trucks, and electronics. There is also to be an open forum when a team of experts will answer questions on any mechanical handling subject. Full particulars of the Convention will be circulated shortly.

The Exhibition and Convention are organized by *Mechanical Handling* (Associated Iliffe Press, Dorset House, Stamford Street, London, S.E.1) with the support of the following associations: Aerial Ropeways Association, Association of Crane Makers, Foundry Trades Equipment and Supplies Association, Industrial Truck Manufacturers Association and the Mechanical Handling Engineers Association. A 25-minute colour film, made of the working exhibits in the last exhibition and giving a good idea of the scope of the coming one, is now circulating in Canada, Australia and India and is available there and elsewhere on application to any British Government information office or direct to the organizers.

Engineering in Europe

Abstracts from Foreign Technical Journals

AN experimental investigation was carried out on a special transformer model simulating a voltage transformer of the class above 150 kV. The primary winding was arranged in a way which corresponded as closely as possible to the parallel-series CL equivalent circuit conventionally used for representing transformers under surge waves. The coils were exchangeable, and actually were exchanged during the tests, particularly the front coil, so as to make the effects of the entrance turns on the potential distribution as conspicuous as possible.

The front coil had initially the same number of turns as all the other coils; the number of turns was subsequently reduced to 30, and gradually increased to 1,500 (65 per cent of total number of turns). The complete change of the voltage distribution with every change of the front coil is striking. It was also found that the fact that the core was insulated from earth and connected to the mid-point of the winding reduced the gradients along the winding and also the voltages against core compared with the case of an earthed core.

Other experiments showed that considerable reflections took place between front coil and first normal coil of the winding (since these have different surge impedances). In these reflections the wave amplitude increases with the dynamic impedance L/KR of the front coil. These oscillations may be attenuated by a capacitance shunted across the front coil. At any rate, a front coil consisting of few turns with reinforced insulation is a danger to the rest of the winding, when stressed by surge waves. Means of protecting voltage transformers were also tested and simple series resistances answered surprisingly well in this respect.—" Effect of Steep-Fronted Surge Waves on Voltage Transformers and Protective Systems." A. Sperti and G. Zingales, *Energia Elett.*, Vol. 30, No. 6, pp. 350–356, 1953, in Italian.

Overhead Line Construction Problems

The author criticizes the fact that the revised V.D.E. regulations are still based on a formula for determining the " normal " additional ice loads in terms of the conductor diameter which was adopted decades ago. The objection is not against " obsolescence " of the formula, but against a purely statistical and not physically founded formula. The British regulations are, by contrast, founded on a physically sound formula which, although yielding for a certain range of the diameter about the same values as the German formula, is more reliable for very small and very large conductor diameters.

Neither German nor British regulations permit tensile stressing of the conductor anywhere near the actual breaking strength of the materials, which the author criticizes as exaggerated cautiousness, although he also shows that it is actually due to the fact that overhead line designers do not work with the available mechanical equation of state of the line.

Reliable data for a more economic procedure in dimensioning conductors are easily obtainable by establishing authoritative values for the " permissible " elastic limit of conductor materials which, obviously, is only a matter of correct definition. The author suggests defining it as 75 per cent of the sustained tensile strength (where the inelastic elongation is only 0·01 per cent). A simplification in the equation of state of a line with wind pressure is obtained by introducing an " apparent span length " suggested by the author, this eliminating the wind pressure from the equation.—" Mechanical Problems in the Construction of H.V. Overhead Lines. Critical Consideration of the Existing Regulations for Overhead Lines with Suggestions for Improvements," M. Vidmar, *E.T.Z.(A)*, Vol. 74, pp. 541–543, 1953, in German.

Oil-Poor Circuit Breaker

The name " Conel " indicates concentric electrodes or conductors, which is an important design characteristic of this very compact and efficacious breaker. It is a single-break type with removable small oil tanks, swivelling quenching chambers and built-in current transformers of the loop type, serving protective as well as measuring purposes. The quenching chambers are based on the cross-blast principle. The drive is spring-controlled, the spring being tensioned over a cam-drive either by the built-in single-phase collector motor or by hand.

The rupturing capacity of the breaker described is 415 MVA at 10 kV, but current peaks of 60 kV can be safely handled. A compensation of the gas pressure assures that the breaking speed remains constant from no-load to maximum load. A special feature is the high contact pressure obtained by the special arrangement of the axial pressure contacts. Since there are no special arcing contacts, the main contacts are fitted with elmet-tips, preventing burning of the copper contacts.—" The New Oil-Poor Circuit Breaker ' Conel ' of Hazemeyer Ltd.," H. de Rook, *Electro-Techniek*, Vol. 31, No. 16, pp. 292–297, 1953, in Dutch.

Transmission Line Mast Foundations

The article, intended as the first of a series on the subject, surveys the historical tests in Switzerland, 1918–1923, culminating in G. Sulzberger's publications on the calculation of mast foundations. These formed the basis of the Swiss regulations of 1933 and block foundations of the type so calculated were generally used for lines up to 150 kV with narrow-base masts. Considerations of an economic character enabled new solutions to be found for systems erected with a view to subsequent change-over to 380 kV.

The types so created are individual leg foundations (with stub angle embedded), partly taking the form of bungs which, however, are used only for wide-base towers. Interesting tests on uprooting such foundations sunk in sandy, clayey and gravelly soils are reported. The last section deals with modern trends and the development of a frame-type foundation in which the soil encompassed also acts as a stabilizing weight. This seems to be the most suitable type for difficult alpine situations on rocks and glacial deposits.—" Development in the Foundations of Transmission Line Masts," J. Killer, *A.S.E. Bull.*, Vol. 44, pp. 775–779, 1953, in German.

Readers who require accurate full translations of any of the articles abstracted in this section can be put into touch with the translators who will supply them at current rates.—Editors, *Electrical Review*.

(1) Houses in New Lane. (2) Block of flats at Clarence Farm East. (3) The shopping centre in Ward "A." (4) Houses at Clarence Corner

Aycliffe New Town

Developing a Purely Residential Area

Below: *Aerial view of Aycliffe New Town*

UNLIKE other new town development schemes Aycliffe New Town, seven miles north of Darlington, is not concerned with the siting of factories, its object being to provide living, cultural and recreation amenities for the persons employed in the fifty or so factories situated on the adjacent 900 acre trading estate originally established during the war as an ordnance filling station. The 867 acre area scheduled under the scheme is somewhat smaller than that of other new towns and provides for 10,000 inhabitants compared with 50,000 or more. Also it contained very few existing buildings and inhabitants, the latter numbering less than a hundred. There is no village on the periphery—the old village of Aycliffe is 1½ miles away. It is in fact the only really new town. No electricity, water, gas or sewage services were available other than a small water main and a sewage disposal works on the adjacent trading estate.

The scheme, which was commenced in 1948 and is expected to take about another six years to complete, divides the town into five housing sections (described as "wards") and a general section providing services for the town as a whole. So far the work has been mainly concentrated in the southern part of the area, known as the Clarence Farm estate. Here, for the use of key personnel and their families, forty-one all-electric prefabricated aluminium bungalows were opened in November, 1948, and since then the erection of permanent houses and flats of between forty and fifty types with one to five bedrooms has been proceeding steadily until 1,100 have been completed, the present rate of construction being about 450 a year.

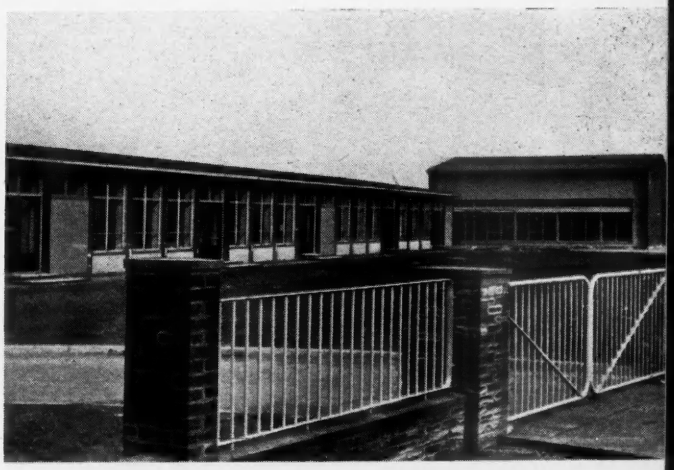
The electricity requirements for the new town are supplied by the North Eastern Electricity Board (Tees Sub-Area manager, Mr. S. Tillotson). The initial supplies were given from the 20 kV system in the neighbourhood. The whole of the development could not, however, be supplied from the existing 20 kV system and it was decided to install two 0·2 sq in 3-core 20 kV underground feeders from the Skerneside 66/20 kV transforming station situated approximately two miles from Newton Aycliffe, to a main h.v. distribution switch house erected in the approximate centre of the new town. To ensure adequate supply capacity for the new town, an additional 15 MVA 66/20 kV Parsons O.L.T.C. transformer is being installed at the Skerneside substation.

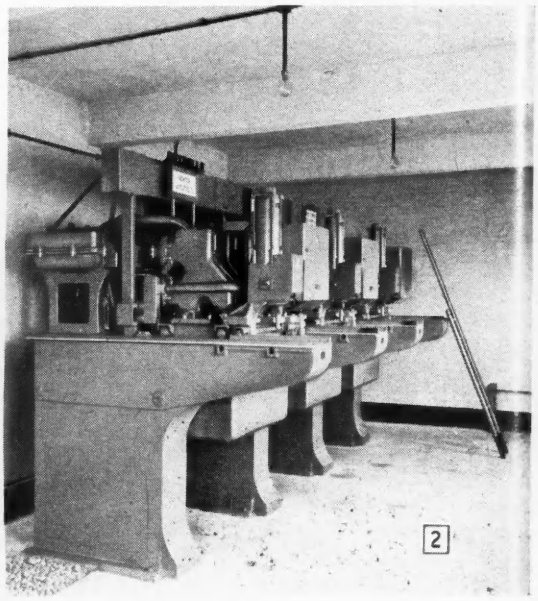
In the central h.v. distribution switch house, Reyrolle type AGT spring-charged 20 kV 400 A switches with a fault duty rating of 250 MVA are installed for controlling two 20 kV underground ring mains, one of 0·15 sq in 3-core supplying eight substations and the other of 0·10 sq in 3-core supplying six substations. The remaining four substations allowed for in the scheme will be supplied by the cables from Skerneside.

Each distribution substation on the ring mains has an alternative h.v. supply and each ring main is provided with Merz-Price balanced protection. Pilot cables are laid with the main h.v. cables and Merz-Price protection is provided on the low voltage side of the transformers. Each ring main has automatic circuit breakers in one substation; the others have bolted link isolators on the incoming 20 kV cables. Each transformer can be isolated from the ring main by the operation of circuit breakers or 20 kV air break isolators of the quick break pattern, manufactured by Metropolitan-Vickers.

The total installed transformer capacity in the distribution substations will be 11,500 kVA. Ten of the substations will have an ultimate capacity of 750 kVA each and the remaining eight will have an ultimate capacity of 500 kVA. At present only five of the substations have been put into commission. The low voltage distribution switchboards in each substation are of the unit type with h.r.c. fuses, manufactured by Adamson Green & Co., Ltd.

Sugar Hill Primary School





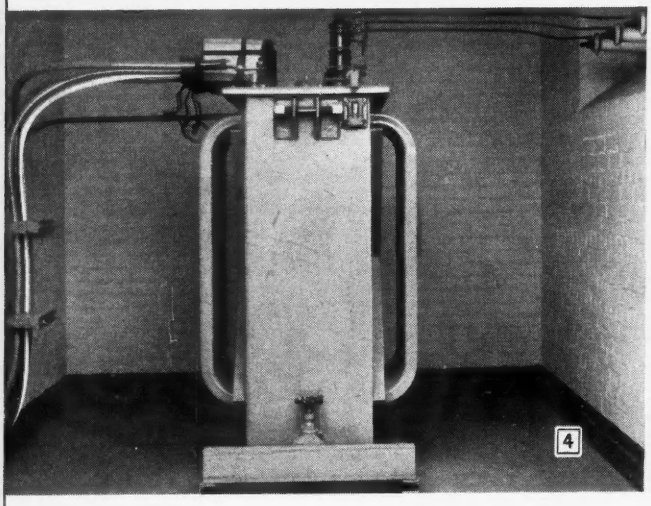
(1) Newton Aycliffe switch house. (2) Reyrolle 20 kV type "A6T" circuit breakers in the Newton Aycliffe switch house. (3) Aycliffe Baliol substation. (4) 300 kVA 20,000/433/250 V transformer at Aycliffe Lowery substation. (5) L.v. switchboard at Aycliffe Lowery

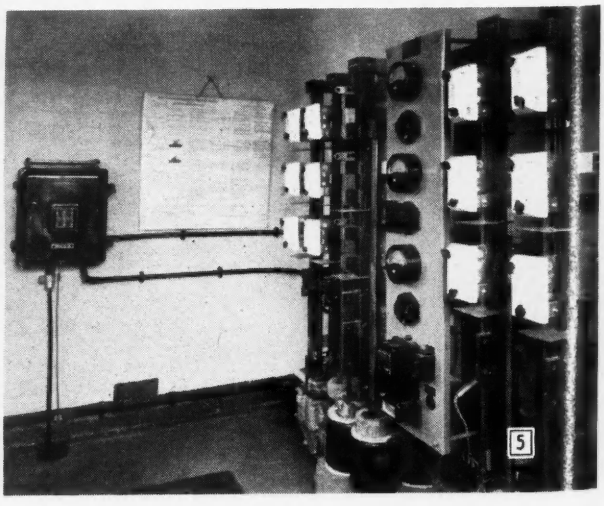
From the substations, each of which will have a supply radius of approximately 300/400 yd, are laid either 0·30 sq in 4-core or 0·20 sq in 4-core distributors in radial formation, the section of these distributors being reduced to 0·10 sq in 4-core or 0·06 sq in 4-core at the extremities of the networks. Where possible link boxes are installed between adjacent networks to enable transformer and switchgear maintenance work to be carried out in summer.

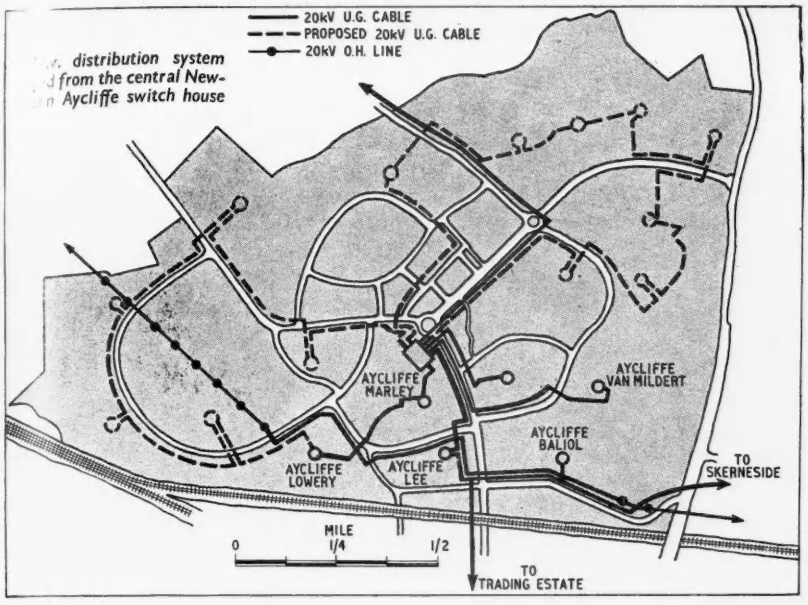
The number of houses supplied from each substation will vary between 100 and 350 and in designing the networks allowance has been made for an anticipated m.d. of 2·2 kW per house. The present figure is about 0·7 kW.

Up to the present 3,900 yd of high voltage cable and 14,000 yd of low voltage cable have been laid on site. Connections have been made to over 1,000 houses and flats, a council school, a community centre, a church, 120 garages and 13 shops, as well as 115 public lighting columns. In addition arrangements have already been made to service another 1,650 houses and flats, 35 shops, 154 garages and 45 more public lighting columns.

All domestic properties on the new town site are wired







for lighting, heating and cooking. The choice of gas or electricity for cooking purposes is left to the tenants, who can rent two- or three-hotplate cookers from the Corporation. Hoover washing machines and Electrolux refrigerators can also be hired from the Corporation at weekly rentals. Occupiers of the flats have at their disposal communal laundries fitted with Bendix washing machines operated through prepayment meters.

The Corporation has given a considerable amount of thought to street lighting in an endeavour to get away from stereotyped street lighting columns. It is now erecting a 15ft street lighting column to its own design, fitted with one 40 W and one 60 W tungsten lamps, and arranged for all-night and half-night burning. In addition, three 36ft steel columns each incorporating three 240 W G.E.C. m.v. lamps have been provided on the aluminium bungalow site, and the Corporation is now erecting five 40ft pre-stressed concrete standards fitted with 5ft cantilever arms. The columns are fitted with winding gear in the base to facilitate the raising and lowering of the canopy, which accommodates three 240 W Siemens mercury vapour fittings.

In the first stage of development of the town, the Corporation has proposals for the erection of 230 columns, but the full street lighting requirements have not yet been determined. Street lighting control is by means of Sangamo Weston time switches.

For their assistance in the preparation of this article we are grateful to Mr. A. W. Thomas, general manager of the Aycliffe Development Corporation, Mr. C. E. Traylen, commercial officer, Tees Sub-Area, North Eastern Electricity Board and Mr. J. H. Bainbridge, district commercial engineer, Bishop Auckland.

ATOMIC ENERGY RESEARCH

TWO papers by Mr. K. Kandiah (Atomic Energy Research Establishment) and one by five authors, Messrs. F. S. Goulding and J. C. Hammerton (both of Atomic Energy of Canada, Ltd.), M. G. Kelliher (Mullard Research Laboratory), A. W. Merrison (Liverpool University) and E. R. Wiblin (A.E.R.E.) were presented on 5th January before the I.E.E. Measurements Section.

In his first paper Mr. Kandiah described a scaling unit for counting regular or random electrical pulses which employed multi-electrode cold cathode tubes. Such tubes contained the basis of a decimal counter in a single envelope, allowing a large number of digits to be stored in a compact instrument without recourse to the mechanical registers often required in scaling units having thermionic valves. Particulars were given of a novel and simple method of driving these scaling tubes in which the amplitudes and duration of the rectangular pulses to all stages were determined by a common pulse generator, which promised reliable operation over long periods, cold cathode trigger tubes being used as gating elements between the stages. A new type of pulse amplitude discriminator of high sensitivity was used at the input to the scaling unit. Early indication of deterioration of tube characteristics was obtained by the incorporation of a system of marginal testing of the complete equipment. The scaling unit described was intended for applications in which amplitude discrimination of pulses was required and a resolution of 50 microseconds was adequate. As the total power consumption was less than 50 W, the rise in internal temperature was small, reducing risks of failures of components.

In his second paper Mr. Kandiah described a new type of trigger circuit, for either positive or negative pulses, in which the sensitivity was not dependent on the contact-potential variations in valves. A threshold of less than 100 mV with a stability of over 2 per cent could, he stated, be achieved under operating conditions. The circuit could also be used as a normal trigger circuit with less accurate threshold down to 5 mV. Sensitivity was mainly determined by two conductances in a diode in the retarding field region and by two valves passing constant currents. Experimental confirmation of the theoretical calculations of sensitivity were given and the minimum pulse width for operating the circuit was shown to be of the same order as for conventional pulse-amplitude discriminators.

The paper by the joint authors gave details of the time of flight neutron spectrometer for intermediate energies which was installed at the Atomic Energy Research Establishment. This machine, which had as a pulsed neutron source the newly developed travelling wave linear electron accelerator, rated at 3·2 MeV, and was associated with a large number of precise electronic units, was stated to be capable of greater refinements at neutron energies of about 1,000 eV than were obtainable when it was developed. The energy resolution at energies over 10 eV was rather better than that previously available for comparable counting rates. This was illustrated by reference to experimental observation of the total neutron cross section in the neighbourhood of a scattering resonance at 120 eV.

NEW ELECTRICAL EQUIPMENT

Reflector Cleaner

THE EFFICIENCY of lamps and lighting can deteriorate considerably if they are not regularly and thoroughly cleaned. With this in mind the BENJAMIN ELECTRIC, LTD., Brantwood Road, Tottenham, London, N.17, has developed a new form of detergent compound for the rapid and safe cleaning of all kinds of reflecting surfaces, at the same time removing static charges from plastic reflectors.

The cleaner is contained in a standard size of airtight tin, lacquered to prevent rusting and containing about 1¾ lb; the price is 4s. There are many domestic purposes for which the material can be used.

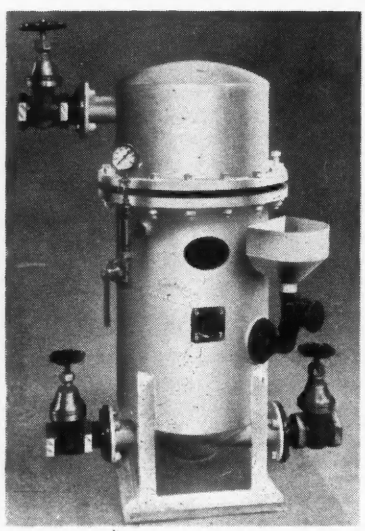
Transformer Oil Filter

In use, transformer oil eventually becomes contaminated with sludge and moisture, reducing the dielectric strength and causing undesirable deposits of sludge on coils and mechanism. It also tends to increase in acidity, and this trouble is aggravated by the presence of impurities. In switchgear the oil becomes carbonized, particularly after operation on faults or heavy loads.

The "Stellar" filter made by the PATERSON ENGINEERING CO., LTD., Windsor House, Kingsway, London, W.C.2, will successfully deal with this class of oil and restore its original value on dielectric test. The filter consists of a specially constructed element formed by a wire wound in a screw thread over a rigid foundation. This forms an unchokable strainer on which a filter bed of kieselguhr powder is deposited. Filtration may be of any desired degree of fineness depending only upon the grade of material used for the filter bed.

The filter shell is constructed of steel or other metal dependent upon the character of the liquid to be filtered. An observation port is provided on the body of the shell so that the formation of the filter bed on the elements may be observed. The standard construction consists of mild steel filter shell, gunmetal valves, elements in extruded brass electro-tinned after manufacture and wound with Monel wire.

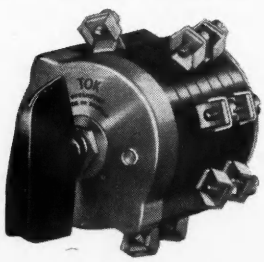
"Stellar" transformer oil filter



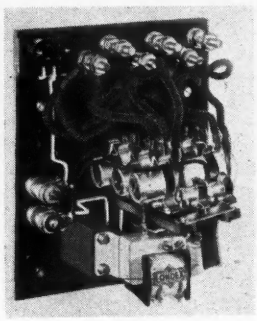
Packet Type Rotary Switch

A packet type rotary switch rated at 13/25 A a.c./d.c. or a.c. only, has been added to the range of rotary switches produced by TOK ELECTRICAL & INDUSTRIAL MECHANISMS, LTD., 264/270, St. John Street, London, E.C.1.

This switch, although of very robust design, is in fact very compact. Considerable saving in height has been achieved by suitable design of the top, which is die cast and encloses the operating mechanism for both the a.c./d.c. and a.c. only patterns. The packets are Bakelite mouldings. The switch can be back of panel, flush or surface mounted. Standard circuits available from stock include motor reversing; single, double and triple pole "On-Off"; and various standard selective switching sequences. The switch can be operated by a plain black pointer knob, white dial knob for "Off-High-Med-Low" sequences and extended ball handle for machine tool applications. The capacity can be increased to 25 A for certain sequences by parallel wiring of the contacts.



Above: Tok 13/25 A packet type rotary switch. Below: Londex mercury switch contactor



Mercury Switch Contactor

The range of LOA mercury switch relays made by LONDEX, LTD., Anerley Works, 207, Anerley Road, London, S.E.20, has been extended to include a new heavy duty 60 A triple pole unit. By using an economy resistor in series with the relay coil, the consumption is limited to 9 VA, and the contactor can thus be controlled by a thermostat or other low-power device.

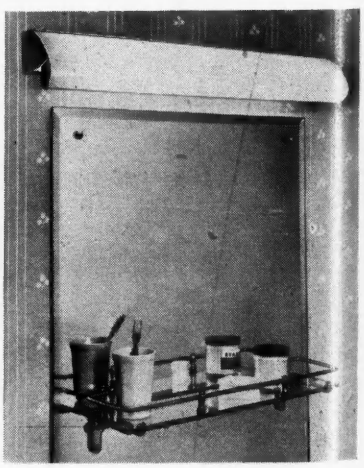
The totally enclosed contactor can handle up to 500 V and it has many possible applications in industry, particularly in hazardous positions and where space is limited. It is, for example, suitable for control of pump motors, and heating and lighting loads, many of which have previously been outside the range of this type of relay contactor. It is available mounted on a baseplate or in a sheet metal or cast iron case. (Londex list No. 159.)

Fluorescent Wall Fitting

The "Atlas" GU/0020 wall mounting fluorescent lighting unit introduced by THORN ELECTRICAL INDUSTRIES, LTD., 105–109, Judd Street, London, W.C.1, accommodates a single 20 W tube behind a peach tinted plastic diffuser. Besides its use in the home over shaving mirrors, as a bedlight, to illuminate pictures or for similar purposes, the fitting is also suitable in commercial and industrial fields for the illumination of notice-boards, display panels, etc.

Special attention has been given to ease of installation, keyhole slots in the chassis enabling the fitting to be hung on two 1½in No. 8 screws. The list price is 82s 6d (plus 7s purchase tax). A cord pull switch can be provided at small additional cost.

"Atlas" wall mounting fluorescent lighting unit



VIEWS on the NEWS

By REFLECTOR

AFTER long agitation, the Chancellor of the Exchequer has conceded the point that discrimination in favour of gas and against electricity in the matter of purchase tax is inequitable. Electric heating is no longer to be considered iniquitous; it has long been clear that the effect of electric heaters on the peak has been grossly exaggerated and now that the plant position is so much better that effect has been further diminished. The reduction of tax on electric immersion heaters to 50 per cent, the same level as for gas water heaters, was even more overdue, for there was never any justification for the difference.

* * *

I notice that in its December issue *Gas Service* makes great play of some statements included in the article in the *Electrical Review* of 16th October by Miss Joan Whitgift and Mr. C. D. Braithwaite on " Selling Electric Cookers." The article was a candid one and analysed the reasons for the gas industry's comparative success in this field in recent years. They are well known: the plant shortage put a brake on the rate of electrical advance and created an atmosphere of caution (and maybe even slackness) among electricity sales staffs. Being practically free from such inhibitions, the gas industry was able to " cash in " on the position, but the authors aimed at showing that conditions had now changed and were favourable to a revival. They admitted that many electrical people use gas for cooking. This is usually because they have acquired houses equipped for gas cooking and, human nature being what it is, they put up with it rather than make the effort to change over. I have no doubt that there are quite a few gas people in a similar situation. Nevertheless it is desirable that precept and practice should be properly reconciled and electrical men and women should cook electrically.

* * *

The Christmas lectures for older schoolchildren which are arranged each year by the principal technical institutions continue to maintain their popularity. Last week when I visited the Institution of Electrical Engineers there was practically a " full house " for the lecture on " Electricity Through Gases "—the eighth in the series—given by Dr. J. H. Mitchell, who is head of the Research Department of Ericsson Telephones, Ltd., at Beeston, Notts, and on the following day a further 500 children attended the repeat lecture. Expounding such an involved subject as electric discharges to an audience ranging from fourth to sixth form standards required a special technique and I was struck by the smooth manner in which Dr. Mitchell overcame this problem. After a clear explanation of electrical terms, he developed his theme by means of a series of experimental analogies. There followed demonstrations of the fundamental properties of a discharge, showing the characteristics of the spark and the sound pressure built up, the characteristics of the glow discharge and the oscillatory nature of all discharges. By means of animated diagrams the simple theory of ionization and excitation of a gas was given and the theory proved experimentally by successive stages in the evacuation of a discharge tube. The lecture concluded with reference to some newer devices, including a film showing the working of the Dekatron and a new display device, the Alphabet tube, not previously demonstrated in public.

* * *

I appreciate the distinction between " electric " and " electrical " to which Mr. J. A. Stedman, E.D.A.'s education officer, drew attention last week, but he will admit that it is not always observed, particularly when appliances are involved. While motors, cookers, lamps and most other items are invariably " electric," for accessories, instruments and equipment generally " electrical " is preferred. In this connection (or nearly) I would mention another example of the American habit of converting adjectives to substantives. It is the use of " electrics " by the Royal Navy and R.A.F. to describe the installation and maintenance of electrical equipment in ships and aircraft. I suppose it follows almost naturally upon the use of the term " electronics " but I do not like it. It is of the company of " executives," " murals " and " musicals." I hope nobody will ask me for a reasonable alternative to " plastics."

* * *

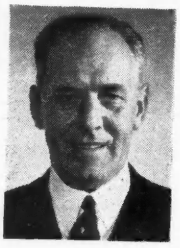
Last week I made reference to a few editorial items in the first issue of the *Electrical Review* for 1874—eighty years ago. The advertisements were also of considerable interest. For instance, the British Telegraph Manufactory, Great Portland Street, London, W., was offering Sir C. Wheatstone's ABC telegraphs, magneto-electric counters and bells, and magnetic exploders (" the surest and safest in action of any "). From Robert Offord there could be obtained electric bells, indicators, clocks, thief detectors and fire alarms. The best German silver and copper wires covered with silk and cotton and " improved india-rubber and gutta-percha covered wires " were available from A. Wells & Co. The last-named wires were " specially manufactured for bells, tunnels, mining, railway and submarine purposes." An ozone generator was advertised by Tisley & Spiller and Julius Sax offered astatic mirror galvanometers, resistance coils and all kinds of testing instruments. One curious device (sold by Sofus E. Holton) was the " Writing Ball " or electric type-writing apparatus which

> " enables the expert to write three to four times as fast as with pen and ink, the blind to write his own letters, him who has lost boths arms still to write and do it fast; it allows 10 copies to be taken in one operation. . . ."

* * *

I am told by the Editors that numerous letters commending the large-sized *Electrical Review* are being received. It seems that readers are satisfied that the enlargement is an improvement. The only complaints have come from those with early postal deliveries who say that the new *Review* will not go through their letter boxes and so they have to be up in time to take it from the postman.

Dr. W. G. Radley



Mr. C. R. King

Mr. N. C. Robertson

Mr. G. J. S. Little

Mr. N. C. Chapling

New Year Honours

Awards to Electrical Men

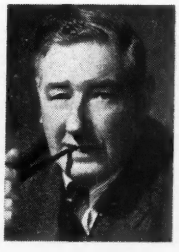
THE New Year Honours List published last week includes a number of names of men in the electrical and allied industries. From this we have made the selection given below.

Knighthoods have been conferred upon MR. OLIVER LYLE, O.B.E., for services in promoting fuel efficiency; MR. G. T. M'GLASHAN, C.B.E., chairman of the Electricity Consultative Council, North of Scotland Area; DR. W. G. RADLEY, C.B.E., Engineer-in-Chief, G.P.O.; and MR. W. C. PUCKEY, lately Deputy Controller of Supplies (Air), Ministry of Supply, and formerly a director of Hoover, Ltd. He is now acting as industrial adviser to companies in the engineering industry, and is this year's president of the Institution of Production Engineers.

MR. M. P. MURRAY, Under-Secretary, Ministry of Fuel and Power, becomes a Companion of the Order of the Bath (C.B.), and MR. N. C. ROBERTSON, M.B.E., deputy managing director, E. K. Cole, Ltd., and formerly Director General of Electronics Production, Ministry of Supply, is made a C.M.G.

New Commanders of the Order of the British Empire (C.B.E.), include MR. N. C. CHAPLING, managing director, Cable & Wireless, Ltd.; MR. C. R. KING, chairman, East Midlands Electricity Board; MR. G. J. S. LITTLE, G.M., Assistant Engineer-in-Chief, G.P.O; and MR. G. DARNLEY SMITH, managing director, Bush Radio, Ltd., and chairman, Radio Industry Council.

The following become Officers of the Order of the British Empire (O.B.E.):—MR. T. H. BAINES, Deputy Director of Radio Equipment (Production), Admiralty; MR. H. BROWN, superintending mechanical and electrical engineer, grade II, Air Ministry; MR. J. CHAMBERLAIN, chief engineer, Aiton & Co., Ltd.; MR. J. H. FRASER, chief officer (signal and telecommunications), British Transport Commission; MR. A. MARSH, Director, National Smoke Abatement Society; MR. A. S. MITSON, Assistant Director, Electronics Production, Ministry of Supply; MR. R. A. MOIR, M.C., chief telephone engineer, Standard Telephones & Cables, Ltd.; MR. J. MOULD, deputy chairman, East Midlands Electricity Board; MR. A. J. NICHOLAS, director and general manager, South Wales Switchgear, Ltd., and a director of Aberdare Cables (Holdings), Ltd., and Electrical Switchgear, Ltd., Montreal; MR. M. J. L. PULLING, senior superintendent engineer, Television, B.B.C.; MR. J. W. JEHU, lately Deputy Director and Engineer-in-Chief, Posts and Telegraphs Department, Nigeria, and MR. R. T. STEVENS, M.B.E., Director, Electricity & Telephones, Mauritius.



Mr. G. Darnley Smith

Mr. J. Mould

Mr. A. J. Nicholas

Mr. M. J. L. Pulling

Mr. R. A. Moir

Mr. E. J. Jarvis

Mr. W. H. Griffiths

Mr. H. J. Harbour

Members of the Order of the British Empire (M.B.E.), include MR. O. H. BARRON, engineer, Planning and Installation Department, B.B.C.; MR. R. C. BIRNIE, area engineer, Telephone Manager's Office, Aberdeen; MR. J. L. BUCHAN, director and manager, Electrical Department, William Broady & Son, Ltd.; MR. W. J. DIXON, deputy contracts manager (pricing), Automatic Telephone & Electric Co., Ltd.; MR. W. H. F. GRIFFITHS, chief engineer, H. W. Sullivan, Ltd.; MR. H. J. HARBOUR, test controller, E. K. Cole, Ltd.; MR. G. J. HUGHES, senior foreman, Laminated Department, Bakelite, Ltd.; MR. E. J. JARVIS, deputy manager, Surrey Sub-Area, South Eastern Electricity Board; MR. P. S. KENSLEY, works superintendent, Gas Turbine Combustion Production Factories, Joseph Lucas, Ltd.; MR. J. T. SHARP, lately senior assistant engineer (Generation Construction Department), South West Scotland Division, B.E.A.; MR. J. D. D. SHAW, managing director, James Kilpatrick & Son, Ltd.; and MR. J. WILSON, general works manager, Blaw Knox, Ltd.

The British Empire Medal (B.E.M.) has been awarded to the following:—MR. T. H. I. ADAMS, mains foreman, Plymouth District, Devon Sub-Area, South Western Electricity Board; MR. F. ALLEN, inspector, Engineering Department, Head Post Office, Boston; MR. J. W. BROOKES, M.M., technical

(continued on opposite page)

PERSONAL AND SOCIAL

News of Men and Women of the Industry

THE Mond Nickel Fellowships Committee announces that it has made an award for 1953 to **Mr. J. E. Benson** (Metropolitan-Vickers Electrical Co., Ltd., Manchester) to study the technique and interpretation of results of non-destructive testing of metal components in the United Kingdom, on the Continent and in the United States and Canada.

Mr. Arnold H. Human, C.B.E., who has for many years been sole partner in the firm of McLellan and Partners, consulting engineers, of 32, Victoria Street, Westminster, retired on 31st December. The practice is being carried on in the same manner by **Sir Henry Clay,** Bt., **Mr. G. N. Hewett** and **Mr. T. B. Rolls,** who, together with the partners of Merz and McLellan, will be the new partners. Sir Henry Clay, Mr. Hewett and Mr. Rolls have hitherto served with the firm in the capacity of technical directors. Mr. Human will continue his association with the firm as consultant.

Bruce Peebles & Co., Ltd., announce the following appointments with effect from 1st January:—**Mr. G. Henderson,** Assoc. H-W College, A.M.I.E.E., formerly London manager and chief branch office manager (home), has been appointed general sales manager of the company with the title of sales manager, and responsibility to the general manager. He brings to his new position a wide experience on the design and manufacturing sides in addition to many years of sales executive experience. Operating from the company's London office, at present 4, Carlos Place, W.1, and early in the New Year, when the address will be 54, Victoria Street, S.W.1, Mr. Henderson will be responsible for the co-ordination of all aspects of the company's sales organization at home and overseas.

Mr. N. L. Jones, formerly assistant chief branch office manager (home), has been appointed London manager in succession to Mr. Henderson. He has had a wide and varied industrial and commercial experience in heavy electrical plant business. For many years he held a responsible position in the rotating plant sales department at the head office of the company in Edinburgh and he was appointed to the London Office in 1950.

Mr. G. Henderson

Mr. N. L. Jones

The Marconi International Marine Communication Co., Ltd., announces the appointment of **Mr. J. W. Dalton** as manager of its Grimsby depot. **Mr. F. W. J. Grinter,** who since July, 1953, has been in charge of the company's depots at both Hull and Grimsby, will continue to be responsible for contracts business in both areas for the time being. Mr. Dalton, who commenced his service on the seagoing staff of the Marconi Marine Co. in 1928 and has since held various positions, became manager of the Cape Town depot of Marconi (South Africa), Ltd., in 1946. He remained there until October last and his appointment to managership of Grimsby depot follows a spell of home leave.

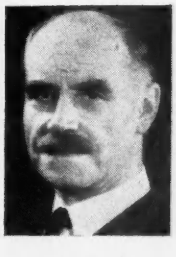
Mr. Dalton's place as depot manager at Cape Town is taken by **Mr. K. Blinkhorn-Street,** who joined the Durban technical staff of the Wireless Agency, Ltd. (later to become Marconi (South Africa), Ltd.), in 1943.

Mr. H. Horwood, A.M.I.E.E., area sales manager of Measurement, Ltd., Electricity Division, has been appointed commercial manager of the combined Electricity and Remote Control Divisions and will operate from the Kennington Works at 7–17, Fitzalan Street, London, S.E.11.

Mr. P. C. Cooper-Parry, O.B.E., M.C., J.P., F.C.A., has resigned from the board of Johnson & Phillips, Ltd., as from 31st December, for health reasons.

It is announced that **Mr. F. Waine** (British Insulated Callender's Cables, Ltd.) has been re-elected chairman of the Cable Makers' Association for the second year. **Mr. M. E. Helwig** (Siemens Bros. & Co., Ltd.) is the new chairman of the Mains Cable Manufacturers' Association and the Mains Cable Manufacturers' Associa-

Mr. F. Waine



Mr. M. E. Helwig

Mr. F. E. Everard

Mr. B. E. Hedley

NEW YEAR HONOURS *(Continued from previous page)*

officer, Telephone Manager's Office, Gloucester; MR. T. CARMICHAEL, substation attendant, Fife Sub-Area, South East Scotland Electricity Board; MR. H. T. CHAPMAN, chargehand fitter, Barnsley power station, Yorkshire Division, B.E.A.; MR. J. J. CHARNLEY, chargehand electrical fitter, Ribble power station, North Western Division, B.E.A.; MR. J. E. COLLEY, turner and borer, Lancashire Dynamo & Crypto, Ltd.; MR. B. V. COOK, lately foreman stoker, London Division, B.E.A.; MR. J. W. DODDS, leading technical officer, Post Office telephone exchange, West Hartlepool; MR. E. A. FARENDEN, inspector, Signal and Telecommunications Department, Railway Executive, Southern Region; MR. C. W. GALE, electrical engineer, N.A.A.F.I. (North Harrow); MR. W. GLEAVE, substation attendant, Merseyside and North Wales Electricity Board (Northwich); MR. A. GREEN, lately foreman, Hilger & Watts, Ltd.; MR. G. W. LEAPER, foreman fitter, South Eastern Electricity Board (Brighton); MR. R. J. W. LEES, crane driver, North Wilford power station, East Midlands Division, B.E.A.; MR. W. MCLAREN, leading technical officer, Post Office radio station, Cupar; MR. S. RINGWALD, electrical engineer, British Resin Products, Ltd.; MR. E. R. SELLARS, foreman electrician, Ransome & Marles Bearing Co., Ltd., MR. F. SMITH, colliery head electrician, Langton Colliery, East Midlands Division, National Coal Board; and MR. G. WILKINS, experimental mechanician, McMichael Radio, Ltd.

tion (Super-tension). **Mr. F. E. Everard,** O.B.E. (Pirelli-General Cable Works), is chairman of the Rubber Cable Manufacturers' Association and the chairman of the Overseas Rubber Cable Manufacturers' Association is **Mr. B. E. Hedley** (Standard Telephones & Cables, Ltd.).

Mr. Charles Bush, F.C.I.S., who has been secretary of Newman Industries, Ltd., since September, 1950, has been appointed a director of the company; he will retain his position as secretary. He was previously with George Wimpey & Co., Ltd., for eleven years.

Mr. George Redfern, M.A.(Cantab), A.M.I.E.E., who has been the chief engineer of the company since

Mr. C. Bush

Mr. G. Redfern

June, 1950, has also joined the board; he will continue as chief engineer. Mr. Redfern was previously chief engineer with the Hopkinson Electric Co., Ltd., Cardiff, and before that was with the British Thomson-Houston Co., Ltd., for thirteen years. He is an associate member of the American Institute of Electrical Engineers.

Sir John Hacking, M.I.E.E., who recently retired from the position of deputy chairman (operations) of the British Electricity Authority, has accepted an appointment as consultant with Messrs. Merz & McLellan, the consulting engineers.

Mr. William Nash, for seven years London representative of Amalgamated Wireless (Australasia), Ltd., an associate of Marconi companies, was recently presented by his Marconi colleagues with a silver cigarette box before his return to Australia. Mr. Nash first came to the United Kingdom with the Royal Australian Air Force during mid-war years, serving in the signals and radar branch. He later served in the Pacific theatre and on demobilization with the rank of squadron leader, rejoined Amalgamated Wireless as personal assistant to the managing director at the main office in Sydney. He returned to London in 1946 to take up the position which he is now relinquishing. He will be succeeded by Mr. D. Craig. Among those who attended the presentation ceremony were Messrs. R. P. Raikes (publicity manager, Marconi's Wireless Telegraph Co.), T. A. Simpson (deputy general manager, Marconi International Marine Co.), J. R. C. Johnson (contracts manager, Marconi International Marine Co.), F. S. Mockford (commercial manager, Marconi's Wireless Telegraph Co.), W. J. Richards (export manager, Marconi's Wireless Telegraph Co.), D. Craig (Mr. Nash's successor), E. H. Cooper (external relations, Marconi's Wireless Telegraph Co.), A. E. Shepherd (technical information manager, Marconi's Wireless Telegraph Co.) and G. T. Kelsey (London representative, Marconi's Wireless Telegraph Co.).

Mr. B. Raynor has relinquished his directorship of John Trapp (Electrical), Ltd., and is now acting as technical representative for British Klockner Switchgear, Ltd. (a subsidiary of Dorman & Smith, Ltd.), in the London area.

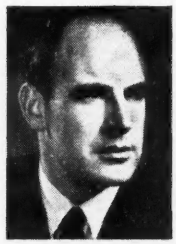
Sir Harry Brown, C.M.G., M.B.E., M.I.E.E., who in 1940 joined the British General Electric Co. Pty., Ltd., of Australia, as chairman and joint managing director and later held the position of full-time chairman, has resigned at the age of seventy-five. His resignation, which took effect at the end of December, was accepted with regret by the board of the British parent company and by his associates on the local board. **Mr. T. E. Morgan,** at present managing director of the British General Electric Co. Pty., Ltd., has been appointed chairman and managing director of the Australian company. At the same time **Mr. A. T. Bridge, Mr. R. J. Darton** and **Mr. C. Drabble** have been appointed directors.

Sir Harry Brown, who was educated at Bede College, Sunderland, and Durham College, Newcastle-on-Tyne, has had a distinguished career. During the 1914–18 war he was responsible for the telephone plant of the United Kingdom and emergency communications for defence systems. He went to Australia in 1923 as technical adviser to the Commonwealth Government in connection with Post Office matters and was afterwards appointed Director-General of Posts and Telegraphs for the Commonwealth.

Sir Harry has frequently represented Australia abroad. In 1927 he was Australia's delegate at the Washington International Radio Conference. The following year he was in London representing her at the Imperial Cable and Wireless Conference. In 1937 he was the Australian representative at the Imperial Telegraph Communications Conference in London. Sir Harry was knighted in 1938.

Mr. L. J. Hawkley, district commercial engineer at Sutton Coldfield, has been appointed sales and contracts engineer with the Jersey Electricity Co., Ltd., with effect from 18th January.

In our last issue we reported the appointments of **Mr. L. W. H. Rea,** B.Sc.(Eng.), general manager, and **Mr. W. Smith,** works manager, to the



Mr. L. W. H. Rea

Mr. W. Smith

board of Edwin Danks & Co. (Oldbury), Ltd. We now reproduce their portraits herewith.

Mr. Clive Barwell, publicity manager of Mullard, Ltd., has recently been elected chairman of the Incorporated Advertising Managers' Association.

Mr. J. C. Breakey, works manager of Hugh J. Scott & Co., Ltd., received a presentation from the staff and employees of the company on his departure to take up the position of manager of Fraser & Borthwick, Ltd. Mr. C. Arkell, manager of the electrical department, made the presentation, which was a set of golf clubs for Mr. Breakey and a chair for Mrs. Breakey.

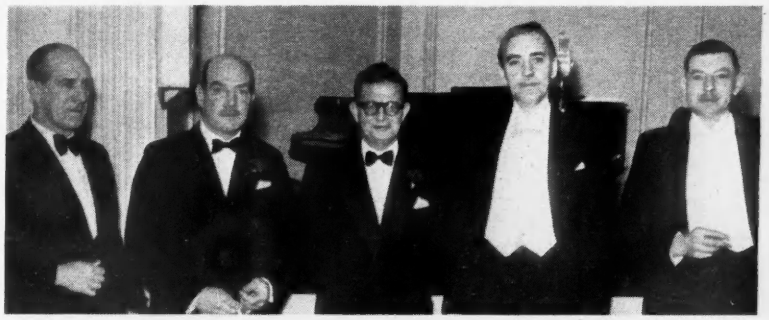
Mr. A. D. Batten, Graduate I.E.E., formerly with the Midlands Electricity Board at Worcester, is leaving this country on 17th January to take up

Mr. F. S. Mockford making a presentation to Mr. W. Nash, London representative of Amalgamated Wireless (Australasia), Ltd., who is returning to Australia

the appointment of assistant area engineer-south with the Trinidad and Tobago Electricity Commission.

The annual dinner and dance of the West London Branch of the **Association of Supervising Electrical Engineers** was held at the Clarendon Restaurant, Hammersmith, on 2nd January. The principal guest was Mr. S. L. M. Barlow, president of the Electrical Contractors' Association, who proposed the toast to the A.S.E.E. Mr. Barlow referred to the close relationship between the two associations and commended the A.S.E.E. for the great contribution it was making in the fields of education and technical training within the industry. In his response to the toast, Mr. H. Clifton, chairman of the Branch, expressed the Association's pleasure at Mr. Barlow's presence.

The general secretary, Mr. E. A. Bromfield, proposed the toast to the ladies, many of whom, he said, were members of the E.A.W. Mrs. J. E. Hainsworth replied on behalf of the ladies and paid tribute to the work of Mr. J. H. K. Pendry, secretary of the Branch. The past-chairman's certificate to Mr. A. P. Hunt was presented by Mr. J. Flood during an interval in the dancing.

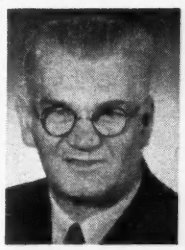


Left to right: Messrs. J. H. Pendry, S. L. M. Barlow, H. Clifton, E. A. Bromfield and J. M. Harding (vice-chairman)

The National Coal Board has appointed **Mr. L. H. Daniel,** M.Sc. (Eng.), M.I.E.E., at present deputy chief engineer of the Ministry of Supply's Fighting Vehicles Research and Development Establishment, to be director of its new Central Engineering Establishment to be set up at Bretby, Derbyshire. The Establishment will have two main functions, the development of new machinery and equipment, and testing. Mr. Daniel was educated at Woolwich Polytechnic Secondary School from 1916 to 1924, and graduated at Queen Mary College in 1928. He was a student apprentice with the British Thomson-Houston Co., Ltd., from 1928 to 1931 when he joined the laboratory staff of the British Electrical and Allied Industries Research Association. From 1939 he worked for this Association on Government contracts. Mr. Daniel joined the Ministry of Supply in 1946 as senior principal scientific officer, becoming deputy chief engineer in 1949.

Mr. L. H. Daniel

Mr. L. H. Welch, B.Sc.(Eng.), M.I.E.E., manager of the Northern Sub-Area of the London Electricity Board, has been appointed chief engineer to the Board. He received his technical education at Battersea Polytechnic and during the 1914–18 war served in the R.N.A.S. and the R.A.F. In 1925 he was appointed assistant construction engineer with the British Thomson-Houston Co., Ltd., in the London, Eastern Counties and South England area, and two years later became distributing stations engineer with the London Power Co. He joined Central London Electricity, Ltd., in 1936 as distribution engineer, and from 1944 to 1948 was assistant chief engineer to the company. On nationalization he was appointed manager of the Western Sub-Area of the London Electricity Board, and in April last year became Northern Sub-Area manager to the Board.



Mr. L. H. Welch

Mr. H. S. Smith, London district labour relations officer, British Electricity Authority, has become personnel officer to the London Electricity Board. Mr. Smith received his education in London, Belfast and Dublin, and from 1917 to 1935 held various positions with the Dublin United Tramways Co. up to substation engineer. He joined the Electrical Power Engineers' Association as assistant secretary (southern) in 1935 and in 1946 became assistant general secretary of the Association.

Mr. G. E. Jewell, director of the London Electric Wire Co. & Smiths, Ltd., has been re-elected chairman of the Covered Conductors' Association.

Mr. G. F. Travis, director of Connollys (Blackley), Ltd., has been appointed vice-chairman.

Some 200 members of the staff of the **Edison Swan Electric Co., Ltd.,** and friends were at the Criterion Restaurant, Piccadilly, on 16th December when the annual Christmas dinner and dance, organized by the Social Club, was held. Mr. A. E. Burkett, chairman of the Ediswan (C.X.RD.) Social Club proposed the toast to the company, and Mr. H. Butterworth, managing director, responded.

At the dinner of the **Ferranti Long Service Club** held on 21st December gold wrist watches and long service certificates were presented to twenty new members who have completed forty years' service with the company during 1953. The presentations were made by Sir Vincent de Ferranti, M.C.

Mr. W. Sweetman has been appointed area manager for the North of England for Parnall (Yate), Ltd.

The annual staff Christmas Party of **Aerialite, Ltd.,** was held on 21st December. During the evening a gold wristlet watch was presented to Mr. L. S. Hargreaves, managing director, to commemorate the twenty-first anniversary of the company.

In May last **Miss M. E. Smith,** trainee demonstrator in the Chelmsford District of the Eastern Electricity Board, took her City and Guilds examination for plain cookery in competition with 1,611 other candidates throughout Great Britain. She has now been advised that, in addition to obtaining a First Class pass, she has been awarded the Silver Medal for top marks in all Great Britain. She also gains the award of a prize of £5 5s from the Worshipful Company of Cooks. Miss Smith took the whole of her training at the Mid Essex Technical

Miss M. E. Smith

College and it is the first time that the award has been made to anyone at the College or in Chelmsford.

The offices of **Mr. K. A. Spencer,** B.Sc.Tech.,A.M.I.Chem.E., A.M.C.T., consulting engineer, are now at 19, Grosvenor Place, London, S.W.1 (telephone: Sloane 4884).

Tickets are still available for the dinner-dance which is being held by the Utilization Section of the Institution of Electrical Engineers at the Café Royal, Regent Street, W.1, on 20th January. Application should be made to the secretary of the Institution, Savoy Place, London, W.C.2, without delay.

The annual dinner of the South Midland Centre of the Institution of Electrical Engineers will be held on 5th February at the Grand Hotel, Birmingham, when Mr. H. Bishop, the President, will attend. Tickets for members and guests are £1 5s each and for graduates and students, 17s 6d each. Applications should be sent to Mr. R. H. Phillips, hon. secretary, 125, Moor Street, Birmingham, 4, by 15th January.

OBITUARY

Mr. C. F. Cogswell, A.C.A., secretary of Philips Electrical Ltd., died on 28th December, at his home in Hayes, Kent, after a long illness. Mr. Cogswell, who was fifty-five, joined the company (then known as Philips Lamps, Ltd.) as secretary in 1928, and as the concern grew he became secretary of many of the Philips subsidiary companies and also a director of several of them. During the 1914–1918 war he was a pilot in the R.F.C., and saw service on the North-West Frontier.

The late Mr. C. F. Cogswell

The late Mr. C. H. Nunn

Mr. C. H. Nunn, manager of the Transformer Works of the General Electric Co., Ltd., collapsed and died as he was about to leave the works on 22nd December. Born at Clacton-on-Sea in 1897, Mr. Nunn saw much active service in the 1914–18 war. After demobilization he studied engineering at the Northampton Engineering College and joined the switchgear drawing office of the G.E.C. at Witton in 1924. Twelve months later he transferred to the Transformer Department and became chief designer in 1934, subsequently being appointed manager of that works in 1938.

Lt.-Col. H. H. Vost.—The death has occurred suddenly at the age of forty-seven of Lt.-Col. Harry Haden Vost, technical sales engineer and Midland representative of the Electric Construction Co., Ltd.

WILLS

Mr. R. Henderson, an engineer in the Traction Department at Kirby of British Insulated Callender's Cables, Ltd., who died on 27th September, left £4,794 gross (£4,702 net).

Mr. F. H. Wright, former managing director of Peerless & Ericsson, Ltd., who died on 22nd September, left £8,858 gross (£8,346 net).

Mr. H. L. Mills, city electrical engineer and manager at Stoke-on-Trent, 1940–44, who died on 23rd September, left £4,998 gross (£4,889 net).

Mr. S. J. Jarvis, electrical engineer, Cambridge, who died on 4th October, left £8,426 gross (£8,193 net).

Mr. E. R. Desoutter, managing director of Desoutter Bros., Ltd., who died on 11th May, left £77,987 gross (£71,199 net).

Major A. Gartside, for more than twenty years associated with the electricity undertaking at Winchester, who died on 3rd May, left £4,731 gross (£4,653 net).

Mr. E. Fawssett, electrical engineer, for many years testing manager with the North Eastern Electric Supply Co., Ltd., who died on 11th July, left £27,297 gross (£27,113 net).

Mr. J. M. Marston, formerly district engineer to the Yorkshire Electric Power Co. and Yorkshire Electricity Board, who died on 19th June, left £1,868 gross (£1,798 net).

Mr. W. A. Gilbert, A.M.I.E.E., of Poole, formerly mains superintendent to the West Ham Corporation Electricity Department, who died on 24th July, left £6,235 gross (£6,031 net).

Mr. J. T. Warburton, for many years with British Thomson-Houston Co., Ltd., Rugby and Liverpool, who died on 17th September, left £8,349 gross (£8,274 net).

Mr. G. Hall, chief plant engineer of Ericsson Telephones, Ltd., Beeston, who died on 27th August, left £3,693 gross (£3,658 net).

Rural Electrification To-day

DURING the five years since the nationalization of electricity, there was a much greater development of electricity supplies in rural areas and to farms than there had been in any years prior to the war, said Mr. C. R. King, C.B.E., chairman of the East Midlands Electricity Board on 4th January. He was giving the first paper—on "Rural Electrification To-day"—at a three day "school" on rural electrification at the University of Nottingham School of Agriculture, at Sutton Boningham, near Loughborough, organized by the British Electrical Development Association and attended by over 130 representatives of Electricity Boards in England, Scotland, Wales, Northern Ireland and Eire.

Mr. King said he was convinced that the farmer, and the rural dweller generally, could make a much greater use of electricity if we were to obtain sufficient revenue from these supplies to meet costs. In this connection, it must be realized that something like 60 per cent of those costs were swallowed up in the purchase of supplies in bulk from the British Electricity Authority. If each Area Electricity Board could gather together a staff of competent and well-trained men who would go out and interview the farmers, to advise and encourage them in the use of electricity on the farm, he was convinced that they could build up a very substantial load in rural areas and, what was perhaps more important, a load which would not necessarily coincide as to peak with the main load for industrial and commercial premises. He thought it essential that the man who approached the farmer must have some knowledge of farming generally.

Ways in which the use of electricity can increase agricultural productivity were outlined on Monday evening by Mr. E. C. Claydon, agricultural engineer, Eastbourne Sub-Area, South Eastern Electricity Board, who spoke on "Applications of Electricity to Farming." Mr. Claydon surveyed the wide range of applications of electricity to farming, and described some of the equipment available. Referring to dairy farms he said that of those employing milk cooling less than 10 per cent had refrigerated coolers. There was an enormous field for development there. If a suitable source of clean water was available on the farm an electric pumping set could provide a service equal to or better than mains water at a fraction of the cost. Mr. Claydon also spoke of the value of electric automatic hammer mills and the great scope for well-planned electric ventilating systems in piggeries. The use of infra-red lamps or heaters for the raising of young stock had made enormous strides in post-war years and there could be few who were unfamiliar with them.

Power Station Inquiry

AN inquiry into the application of the British Electricity Authority for permission to erect a power station at Belvedere, Kent, was opened at Erith Town Hall recently and continued later at the B.E.A. London Division headquarters. It was stated that the Authority needed four new power station sites along the Thames Estuary, the others being at Tilbury, Northfleet and West Thurrock. The Belvedere site, which was purchased for a generating station as far back as 1919, was very suitable for the purpose.

Mr. D. Clark, station development engineer, B.E.A., said that it was the nearest site to London which had the necessary coal and water qualifications.

On the question of chimney emissions, Sir David Brunt, F.R.S., adviser to the B.E.A. on meteorological matters, said it was unlikely that smoke from the station would mix with fog because the gases would be emitted at a higher level. The proposed height of the chimneys was 350ft

Mr. H. D. Morgan, M.Sc. (Sir Wm. Halcrow & Partners) described the dredging operations that would be required, which he said would have no effect on the stable bed of the river. Mr. C. A. Clench, chief generating engineer (construction), B.E.A. London Division, explained the construction of the station, the effect of pile driving on the soil, and the building of a jetty for colliers. A piece of low-lying ground would be used for ash disposal.

A petition against the project by a number of Belvedere residents was read, the grounds of opposition being smoke nuisance, river pollution, interference with radio and television reception, proximity to other power stations, and reduction in rateable value of property. The application was also opposed by industrial interests, Borax Consolidated, Ltd., and F. Boehm, Ltd., expressing concern at the effect of dust on their products.

Erith Council was represented at the inquiry by the Town Clerk (Mr. J. A. Crompton), who said that while the Council had no objection to the proposal to erect the station it was apprehensive for the reasons given on the residents' petition.

PLANT INSTALLED IN 1953

NEW plant installed by the British Electricity Authority during 1953 represented an additional output capacity of 1,413 MW, or nearly 2 million horsepower. This compares with 1,539 MW in 1952 and 1,113 MW in 1951.

The additional plant, comprising thirty-one turbo-generators with an aggregate installed capacity of 1,518 MW and sixty-eight boilers having an aggregate evaporative capacity of 19,725,000 lb/hr, was installed in thirty-four of the Authority's power stations. Eight of these are new stations in which plant has been installed for the first time.

The Authority planned to commission between 1,300 and 1,500 MW of plant in 1953, so that the actual result of 1,413 MW is just above the mean of these figures.

To meet the winter peak demand, the aim each year is to commission the maximum amount of plant by the 31st December and, as a result of strenuous efforts by the Authority's construction staff, building contractors and manufacturers, some plant has been installed in advance of its scheduled date of completion.

The plant listed below, complete with all associated ancillary equipment, has been commissioned during the twelve months of 1953.

Name of power station	B.E.A. Divisions	TURBO-GENERATOR PLANT		BOILER PLANT		MAIN HIGH PRESSURE PIPEWORK
		Installed capacity MW	Maker	Capacity k lb/hr	Maker	Maker
Bankside	London	1 × 60	British Thomson-Houston	2 × 375	Foster Wheeler	C. A. Parsons
Barking "C"	"	1 × 75	" "	3 × 405	Babcock & Wilcox	Aiton
Battersea "B"	"	1 × 100	Metropolitan-Vickers	1 × 425	" "	"
Bold "A"	Merseyside & N. Wales	1 × 30	" "	1 × 300	Yarrow	"
Braehead	South West Scotland	1 × 50	C. A. Parsons	1 × 300	Babcock & Wilcox	Babcock & Wilcox
Brighton "B"	South Eastern	2 × 52	Richardsons, Westgarth	3 × 320	" "	C. A. Parsons
Bromborough	Merseyside & N. Wales	—	—	2 × 300	" "	Stewarts & Lloyds
Brunswick Wharf	London	1 × 52·5	Metropolitan-Vickers	2 × 320	Clarke Chapman	C. A. Parsons
Carmarthen Bay	South Wales	2 × 52·5	" "	5 × 240	Babcock & Wilcox	Stewarts & Lloyds
Carrington	North Western	1 × 60	" "	3 × 360	" "	" "
Chadderton	" "	1 × 60	" "	1 × 360	Simon Carves	" "
Clarence Dock	Merseyside & N. Wales	1 × 51	" "	—	—	" "
Connah's Quay	" "	1 × 30	C. A. Parsons	1 × 300	International Combn.	John Thompson
Croydon "B"	South Eastern	—	—	1 × 320	Simon Carves	Aiton
Deptford East	London	1 × 52·5	Metropolitan-Vickers	2 × 250	Foster Wheeler	John Thompson
Doncaster	Yorkshire	1 × 30	General Electric	3 × 180	Mitchell	Aiton
East Yelland	South Western	2 × 30	C. A. Parsons	4 × 180	John Thompson	C. A. Parsons
Huddersfield	Yorkshire	1 × 30	General Electric	1 × 180	Bennis	" "
Huncoat	North Western	—	—	1 × 305	Simon Carves	" "
Keadby	Yorkshire	1 × 60	C. A. Parsons	1 × 550	Stirling Boiler Co.	" "
Littlebrook "C"	South Eastern	2 × 60	" "	3 × 360	International Combn.	" "
Nechells "B"	Midlands	1 × 52·5	" "	4 × 230	" "	Stewarts & Lloyds
North Tyne "C"	North Eastern	1 × 60	" "	3 × 360	Babcock & Wilcox	Babcock & Wilcox
Poole	Southern	—	—	2 × 300	International Combn.	Aiton
Roosecote	North Western	2 × 30	Metropolitan-Vickers	2 × 300	Yarrow	"
Rotherham	Yorkshire	—	—	1 × 200	International Combn.	Stewarts & Lloyds
Rye House	Eastern	2 × 32	Rich. Westgarth/C. A. Parsons	2 × 350	Babcock & Wilcox	" "
Skelton Grange	Yorkshire	—	—	1 × 360	International Combn.	Aiton
Staythorpe	East Midlands	1 × 60	British Thomson-Houston	2 × 240	Babcock & Wilcox	"
Thornhill	Yorkshire	—	—	2 × 180	Mitchell	Stewarts & Lloyds
Uskmouth	South Wales	1 × 60	General Electric	3 × 360	Babcock & Wilcox	Aiton
Walsall	Midlands	—	—	3 × 180	" "	"
West Ham	London	—	—	1 × 180	John Thompson	"
Westwood	North Western	1 × 30	British Thomson-Houston	1 × 300	Babcock & Wilcox	Stewarts & Lloyds

NOTE.—The power stations whose names are in *italic* type are new stations in which plant has been commissioned for the first time in 1953. The others are existing stations to which extensions have been made.

INDUSTRIAL NEWS

Purchase Tax Reductions

EARLIER THIS WEEK the Commissioners of Customs and Excise announced the reduction of purchase tax on electric space heaters and electric water heaters from 75 to 50 per cent as from 6th January. This involves the substitution of the following for paragraph (b) in Group 12 of Notice No. 78 issued by the Commissioners:—"(b) Space heating appliances (including appliances of a kind used for boiling or cooking and also for space heating), instantaneous water heaters, immersion water heaters, storage water heaters, circulator water heaters for tank storage or central heating, being appliances, heaters or boilers suitable for operation from electric or gas mains . . . 50 per cent."

The effect of this is to reduce the tax on electric space and immersion heaters to the same level as that on gas heaters. Electric thermal storage water heaters already bore a 50 per cent tax.

Tax is reduced from 50 to 25 per cent on "washing machines which are designed for heating water by electricity or gas, but which are not otherwise designed for operation by electricity or gas." Motor driven washing machines remain taxable at 50 per cent.

Fabric lamp shades also become chargeable at 25 per cent instead of 50 per cent.

Electricity Officials' Salaries

After a meeting last month of the National Joint Managerial and Higher Executive Grades Committee it was announced that the Committee had approved the adoption of the following salary scales for application to posts (below the level of Sub-Area manager and chief generation engineer) at the British Electricity Authority headquarters, the generating divisions, Area Board headquarters, Sub-Areas and Districts with effect from 1st April, 1952:—

Scale 1	£1,150 × £50 to £1,300
„ 2	£1,300 × £50 to £1,450
„ 3	£1,450 × £50 to £1,600
„ 4	£1,600 × £50 to £1,750
„ 5	£1,750 × £50 to £1,900
„ 6	£1,900 × £50 to £2,050
„ 7	£2,050 × £50 to £2,200

With the addition of £50 per annum London "weighting" where applicable.

The Electricity Boards having submitted detailed proposals for the application of these scales, agreement was reached on the scale application to present holders of the posts subject to the outcome of further consideration in certain cases. Officers holding posts which are to be the subject of further consideration will be so informed by their Electricity Board when the present proposals are implemented. It is anticipated that salary adjustments necessitated by the adoption of the new scales will be made this month, including also those cases where further consideration is required.

Locomotive's Trial Run

The first of the seven 2,500 h.p. 6-axle electric locomotives under construction for the Manchester-Sheffield-Wath electrification scheme recently started trial running between Dukinfield and Crowden. These locomotives, which each weigh over 100 tons, will be used for hauling both heavy freight and passenger trains. The mechanical parts of the locomotives are being built at the Gorton Locomotive Works of British Railways (Eastern Region) and the electrical equipment is being supplied and erected by the Metropolitan-Vickers Electrical Co., Ltd.

Prices of Materials

In the accompanying table we give the basis prices of the more important materials used in the electrical industry. The figures given are the selling prices and are those quoted on Tuesday last.

ALUMINIUM Ingots	ton £156 0s 0d
COPPER, H.C. Electro	ton £230 0s 0d
Fire Refined 99·70%	ton £229 0s 0d
Fire Refined 99·50%	ton £228 0s 0d
COPPER Tubes ..	lb 2s 3½d
Sheet	ton £291 10s 0d
H.C. wire and strip	ton £265 0s 0d
LEAD, English ..	ton £89 5s 0d
Foreign	ton £88 0s 0d
MERCURY	flask £61 15s 0d
TIN, block (English) ..	ton £650 0s 0d
ZINC, G.O.B. Foreign	ton £73 0s 0d
Electrolytic	ton £74 15s 0d
BRASS Tubes (solid drawn)	lb 1s 10¼d
Sheet	ton £238 15s 0d
Wire	lb 2s 5¼d
PHOSPHOR BRONZE Wire	lb 3s 8d
PLATINUM	oz £27 0s 0d
RUBBER, No. 1 R.S.S. spot	lb 17d–17⅛d

Pye Overseas Contracts

The first overseas buyers of the new Pye industrial television apparatus are Radio Italiana. Recently Pye supplied the Italians with the most up-to-date outside broadcasting unit for Turin. They are now to be the first television service to use miniature cameras—for caption scanning. The industrial cameras, which are more than £100 cheaper than their American counterparts, are claimed to have a much better picture quality. Capable of being run off ordinary power points, they have been designed for industrial purposes ranging from the remote viewing of dangerous processes to security work and advertising. They are already being used by many of Britain's largest industrial firms.

A complete Pye multi-carrier system installed for police work at Adana in the south of Turkey, consists of a 15 W control station, controlling two 50 W repeaters. The whole system is duplex, and it is possible to connect telephone subscribers so that they can speak direct to any of the patrolling police vehicles. A further fixed station has been installed at the port of Mersin. With the aid of directional aerials it is in direct contact with the police headquarters at Adana, 75 km away.

The police authorities intend to purchase further mobile units in the near future, and there are indications that similar installations of this nature will be made in other towns in Turkey for general use and for traffic control purposes.

Selling Domestic Appliancces

One of a series of sales training courses held by Mr. J. C. Andrews, of the English Electric Company's Domestic Appliance Division, is to be held at Cardiff from 12th to 15th January. At this course there will be introduced a new sales manual entitled "How to Sell English Electric Appliances." This is written in a readable style and is illustrated by many photographic reproductions and humorous drawings. The brochure sets out the principal selling points of all the English Electric domestic appliances and gives practical hints on selling methods.

Engineering Wages Dispute

Meetings took place last week between the Minister of Labour (Sir Walter Monckton) and representatives of the employers and employees in the engineering and shipbuilding industries. The employers made it clear to Sir Walter that in their view there was no case for raising wages. With the trade union representatives the Minister discussed the possibility of a postponement of the threatened ban (as from 18th January) on overtime and piecework.

Later it was announced that the Minister had appointed two courts of inquiry. Actually the composition of the courts is the same but since two separate industries are involved evidence will be heard separately for each and two reports will be made. Lord Justice Morris is the chairman of the courts. There are two other independent members, Sir Harold Howitt and Mr. H. Lloyd Williams; the employers' representative is Sir Robert J. Sinclair and Mr. C. J. Geddes will represent the trade union interests. By a narrow majority the Union decided to suspend action while the courts of inquiry are sitting.

Shortage of Science Teachers

A one-day private conference called by the Federation of British Industries to discuss the problem of the shortage of science teachers, its effects on industry, and possible solutions will be held at the Institution of Electrical Engineers on Thursday, 14th January. Members of the conference will be drawn from industrial firms and from the universities, public and secondary schools, technical colleges, central and local education authorities.

Sir Harry Pilkington, president of the F.B.I., will open the conference. At the morning session Sir Charles Morris, Vice-Chancellor of the University of Leeds, will speak on "Science Teachers—the Demand and the Supply"; Dr. A. W. Barton, headmaster of the City of London School, on "The Present Position in the Schools and Some Possible Consequences"; and Dr. P. Dunsheath, C.B.E., chairman of the F.B.I. Education Committee, on "The Industrial Viewpoint." The afternoon session will be devoted to general discussion.

Towers for Norway

Blaw Knox, Ltd., has secured a contract to the value of approximately £300,000 for the design and supply of transmission line towers for Norway. This contract was secured against severe world competition and was placed by Oslo Lysverker for their new 220 kV single-circuit line from Hol to Oslo.

Schoolboys' Own Exhibition

A novel device for encouraging the interest of the rising generation in the manifold uses of electricity has been adopted by the British Electrical Development Association at the Schoolboys' Own Exhibition which until next Wednesday (13th January) is being held at the Horticultural Halls, Westminster. Dressed in "cosmic ray" suits which are based on the protective clothing used at Harwell, the boys are taken on a representation of a voyage through time and space, beginning in the prehistoric age, continuing into the coming age of electronics, and returning once more to the present day. During the course of their journey they see illuminated about fifty different electrical appliances in daily use, with a recorded commentary explaining them. Returning via the "ultrasonic time/space track" (a polished chute) the boys can enter a competition with a bicycle as a prize for the longest list of applications of electricity spotted.

Motor Vehicle Regulations

The Minister of Transport and Civil Aviation has made regulations which came into force on 1st January, 1954, relating to motor vehicles. The effect is to legalize the use of flashing light direction indicators. In future, the following three types of illuminated direction indicators will be legal on motor vehicles in this country:—The semaphore type now in use; in future these may be illuminated by a steady light or a flashing light. A flashing light showing to front and rear, and fitted to the side of the vehicle, illumination being amber in both directions; or flashing light indicators placed in pairs at the front and rear of the vehicle. The regulations also legalize a new type of trailer plate. At present, when a trailer is drawn along the roads it is, in most cases, compulsory to carry a plate in the shape of a letter "T." This type of plate will cease to be legal after the 31st December, 1957. Instead, in accordance with international usage, a triangular plate has been introduced, which can be adopted forthwith. Details of the plate are set out in the regulations.

Transformers for Rhodesia

Transformers (Watford), Ltd., has been awarded a contract for the provision of the station and unit auxiliary transformers for the City of Salisbury, Southern Rhodesia, power station No. 3.

Flashing Beacons in Singapore

The Municipality of Singapore has been experimenting with flashing road beacons and has now placed an order with Venner, Ltd., for synchronizing flashing units for installation in all the main thoroughfares. Several Continental countries have recently installed trial crossings with flashing beacons, in particular Denmark and Holland. A further application that has been tried out in Holland is the installation of a flashing beacon on country roads some little distance in advance of a road crossing to warn the motorist of impending danger.

Lamp Display Unit

A new "Mazda" display piece has been designed to demonstrate the advantages of a "Silverlight" lamp by comparing one with a pearl lamp. It is for use as a counter display and is fully wired, each lamp being provided with a switch. Printed in four colours, the unit consists of a display card with the wording "Mazda Lamps Stay Brighter Longer," in front of which is a model of the "Mazda" dancing girl flanked by pearl and "Silverlight" lamps.

The new "Mazda" counter display "Silverlight" comparison unit

Electrical Imports of Nigeria

Nigeria's imports of electrical machinery and parts on commercial account in 1952 totalled £633,000 in value compared with £559,000 in the previous year, with the United Kingdom contributing the greater part, viz. £615,000 against £489,000. In addition £1,435,000 is the recorded value of unspecified electrical goods imported. The total for radio sets was £95,000 (£3,000 decrease) and for radio parts and accessories £157,000 (£120,000 increase). Other noteworthy items were telegraph and telephone apparatus, £140,000 (£25,000 increase); refrigerators, £168,000 (£41,000 increase); torches, £45,000 (£6,000 increase); and batteries, £394,000 (£138,000 increase).

Training for Management

"Education and Training for Management," the first of a new series of booklets to be issued by the F.B.I. Education Committee, was published last week. It is a study of the attitude of industry to education and training for management rather than a detailed review of the facilities available.

Dr. P. Dunsheath, C.B.E., chairman of the F.B.I. Education Committee, writes in the foreword that the booklet's object is to invite F.B.I. members to satisfy themselves that they are doing what they can to raise the standard of management through education and training. Copies of the booklet (2s each) can be obtained from the Federation of British Industries, 21, Tothill Street, London, S.W.1.

Tungsten Ore Price Reduction

The Ministry of Materials has announced that the selling price for tungsten ores of standard 65 per cent grade and ordinary quality has been reduced as from 5th January as follows: Wolframite from 185s to 165s; Scheelite from 170s to 150s per long ton unit delivered consumers' works.

City and Guilds Award

The Insignia Award in Technology was established by the Council of the City and Guilds of London Institute some twelve months ago. The regulations require that a candidate must be at least thirty years of age and be sponsored by three referees of appropriate standing. He must have been apprenticed or otherwise suitably trained in his industry, he must hold relevant full technological certificates of the Institute, and have had a minimum of seven years' progressive experience in his industry. He is then required to write a thesis of some 10,000 to 20,000 words on a technological topic associated with his work, which must show that he is acquainted with the current practice and problems of his industry at "technological" level. If

this thesis is reported upon satisfactorily the candidate appears for interview before a panel. The Insignia Award Committee, on the recommendation of the panel, will then make its final decision as to the award, subject to ratification by the Council of the Institute. A copy of the regulations and notes for the guidance of candidates, can be obtained from the Director, Department of Technology (I.A.), City and Guilds of London Institute, 31, Brechin Place, London, S.W.7.

Plant for Canada

With reference to the notice in our last issue regarding a 66 MW turbo-generating set ordered by the Calgary Power Co. from the Metropolitan-Vickers Electrical Export Co., Ltd., we are asked to make it clear that this is the largest set ever ordered from the Metropolitan-Vickers Co. for Canada. The inlet steam conditions should have read 850 p.s.i.g. 900 deg F. The new set will be manufactured at the Trafford Park Works of Metropolitan-Vickers.

Radar Equipment for France

The French Embassy in London has placed an order in excess of £100,000 with E.M.I. Factories, Ltd. This order is on behalf of the French Air Ministry, which will shortly take delivery of 100 airborne navigational aid equipments, including spares and test gear. These are Rebecca Mark IV medium range homing devices which, used in conjunction with ground beacons, enable aircraft to be directed accurately to particular sites.

Tinplate Workers' Scholarships

The Court of the Worshipful Company of Tinplate Workers has again decided to offer ten Travelling Scholarships, each to the value of £50, on the same terms and conditions as last year.

Change of Name

Gillott Electro Steam Cookers, Ltd., has changed its name to Gillott Electro Appliances, Ltd.

Australian Refrigerator Market

More severe competition in the Australian domestic refrigerator field during the coming twelve months may hasten the trend, already apparent, towards fewer and larger manufacturers. The market is now reasonably buoyant, but there appear to be too many small and relatively high-cost producers. A few years ago the landed price of a British refrigerator was about 15 per cent above that of comparable Australian units, but the rapid advance in Australian costs has since changed this situation quite considerably.

A feature of the Australian industry of late years has been the movement towards the "sealed motor" compressor units as against the absorption types, and there are now few manufacturers in the latter field.

Imports of refrigerators and parts over the past seven years (mainly from Great Britain) have been: 1946–47, £131,000; 1947–48, £193,000; 1948–49, £789,000; 1949–50, £1,751,000; 1950–51, £1,884,000; 1951–52, £3,528,000; and 1952–53 (a year subject to heavy import cuts), £451,000.

Nyasaland's Increasing Electrical Imports

Nyasaland's imports of electrical material increased in value by one-third between 1951 and 1952, after quite a healthy advance in the former year. The United Kingdom was predominant in the trade, with practically all the telephone and telegraph apparatus which totalled £84,000 and radio goods (£16,000). It also accounted for practically all the increase of one-third under the heading of "electrical machinery, goods and apparatus," and most of that in unspecified electrical, although here there was some competition from South Africa and Germany.

Calendars

The calendar of the Wallacetown Engineering Co., Ltd., has large monthly sheets which also show the preceding and following months.

Panelec (Great Britain), Ltd., has sent us a calendar showing buildings in which the "Panelec" system of wall and floor low temperature radiant warming system has been installed.

The calendar of Fitter & Poulton, Ltd., has monthly sheets, showing the preceding and following months, surmounted by an old English picture of a horticulturist examining his plants.

A reproduction from a painting by F. Danton Adams of a Surrey scene near its Goblin Works, Leatherhead, makes a pleasing picture for the calendar of the British Vacuum Cleaner & Engineering Co., Ltd., which has monthly slips.

A desk calendar with monthly cards, showing the preceding and following months has been received from Nalder Bros. & Thompson, Ltd.

A winter scene illustrating a stage coach in deep snow is the picture selected by the Edison Swan Electric Co., Ltd., for its calendar which has monthly tear-off sheets.

The calendar of James Howden & Co., Ltd., has large monthly sheets with bold figures.

Trade Announcements

Mr. Alec Milligan has been appointed London manager of **Norman Gledhill & Co., Ltd.** He will operate from 9, Queen's Gate Terrace, South Kensington, London, S.W.7 (telephone: Western 0801).

Mr. L. A. Buckley, 315, Lichfield Road, Four Oaks, Sutton Coldfield, Birmingham (telephone: Four Oaks 30), has been appointed Midlands sales representative for the **Reliance Electrical Wire Co., Ltd.**, of Leyton.

The **Cambridge Instrument Co., Ltd.**, has opened a repair and service depot at 7, Norfolk Court, Norfolk Street, Glasgow, C.5.

Adamson & Co. (Tyne), Ltd., have opened a branch at 12-14, Friars Court, Carlisle (telephone: Carlisle 24420), with Mr. J. M. Hunt as manager. A full range of electrical products is being carried, and, as distributors for Crompton Parkinson, Ltd. (Supplies Division), stocks of Crompton cables, lamps and lighting fittings are available.

Mr. W. N. Payne, who has been with **Bill Switchgear, Ltd.,** since January, 1939, has been appointed area representative of the company for the South Eastern Counties and East Anglia.

Catalogues and Lists

Samuel Jones & Co., Ltd., New Bridge Street, London, E.C.4.—A leaflet giving illustrated particulars of "Ever-Ready" tacky labels which can be applied without moisture to all kinds of surfaces and can be easily peeled off.

Birlec, Ltd., Tyburn Road, Erdington, Birmingham, 24.—Five illustrated catalogues containing details of furnaces, furnace brazing, induction heating equipment, etc., together with useful metallurgical and technical information.

Phœnix Telephone & Electric Works, Ltd., The Hyde, Hendon, London, N.W.9.—First comprehensive post-war catalogue; it is of the loose-leaf type and contains seven sections, on telephones and switchboards (TS), telephone and switchboard apparatus (TSA), protective apparatus (PA), bells and buzzers (B), indicators, call systems and accessories (D), wires, cables and line material (W), and batteries, supply units and transformers (S).

Dexray Engineering Co., Ltd., Brock Street, Lees Street, Manchester, 1.—Lighting fittings leaflet illustrating a range of contemporary and wrought iron fittings (LF.4).

Linolite, Ltd., 118, Baker Street, London, W.1.—Current price list of standard "Linolite" reflectors, decorative fittings, fluorescent fittings, signs and lamps.

Pressed Steel Co., Ltd., Cowley, Oxford.—Illustrated broadsheet dealing with "Prestcold" refrigeration for the meat trades (Z.192).

Remploy, Ltd., 25-28, Buckingham Gate, London, S.W.1.—Illustrated catalogue of metal cabinets, racking and lockers.

Aerialite, Ltd., Castle Works, Stalybridge, Cheshire.—Illustrated leaflet dealing with "Ashathene" thermoplastic insulated cables and wiring systems.

General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2.—Two illustrated broadsheets on decorative and commercial lighting fittings.

Information Department

THE extensive records of our Information Department enable us to reply to most queries, but occasionally we ask our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the makers of the following:—

"Nepthol" compound.

"Reliance" potentiometers.

General inquiries from readers relating to sources of electrical goods, makers' addresses, etc., are replied to by the Information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.

Electrical Accidents

Analysis of the Principal Causes in Industry

REPORTABLE electrical accidents (those resulting in more than three days' disablement) in 1951 numbered 715, of which 34 were fatal. From the 20-year record included in the annual report of the Factory Department * it appears that the total bears no relationship to the vastly increased use of electricity in industry—the figure in 1933 being 346, including 25 fatal. A further 73 fatalities occurred in premises not covered by the Factories Act in 1951 compared with 51 in 1933; of these 43 and 21 respectively were on domestic or similar premises. Apart from 152 cases of eye flash from electric welding, skilled men suffered in 289 accidents (10 fatal) and unskilled persons in 274 (24 fatal).

Portable apparatus (often associated with plugs, sockets and flexible cables) accounted for half the fatal accidents and (excluding eye flash) for more than one-third of the total. Failure of the earthing system was involved in 27 per cent of the 290 shock accidents. Improvised test lamp outfits and test leads were responsible for most of the 54 accidents during testing, often due to omission to switch off.

The commonest injury was associated with burns, 361 instances, with or without shock, those with shock also numbering 104. Shock, however, was responsible for all but three of the fatalities. Physical injuries (e.g. resulting from falls) were consequent on 58 per cent of the shocks. Twenty cases of successful artificial respiration and twenty-two unsuccessful ones were reported. Of the former, half gave results within ten minutes and two within an hour. Twenty-one of the 34 fatalities occurred at voltages below 250. The report discusses the relative values of modern resuscitation methods.

Carelessness or ignorance played a part in about 45 per cent of both fatal and total accidents, excluding eye flash. Failure to carry out instructions and improper operation of permit-to-work systems and working on live gear were other factors which resulted in loss of life, several instances of which are summarized.

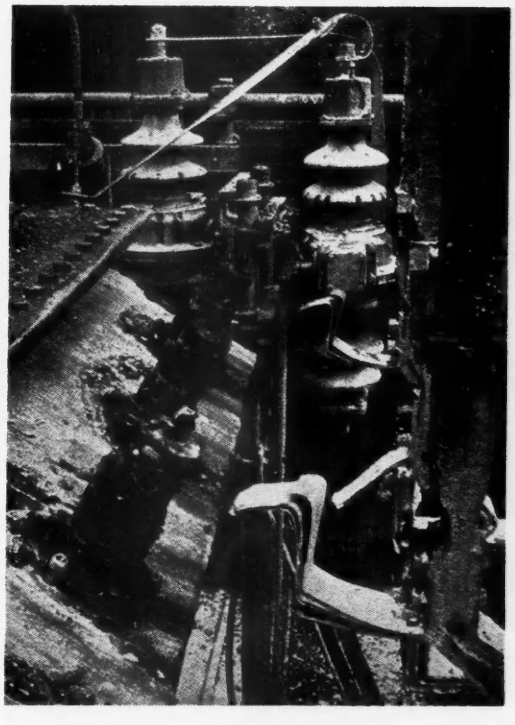
Of the 563 accidents (neglecting eye flash), 114 (none fatal) occurred on d.c. systems, where burns accounted for 89, shock for 17 and a combination of the two for 8. Two-thirds of the accidents with a.c. were between phase and earth. Numerous typical cases, including switchgear failures of explosive violence and/or causing fires, with or without personal injuries, are summarized with comments.

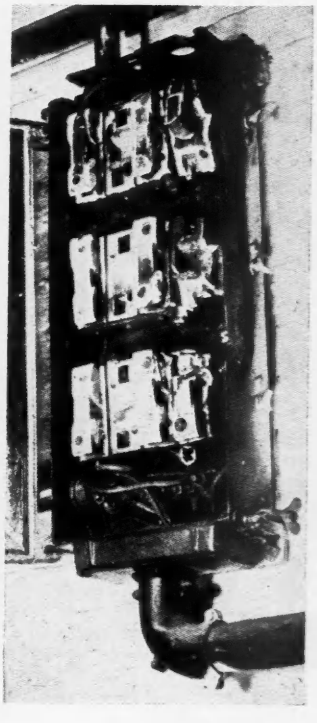
Replacement of circuit breakers by units of adequate rupturing capacity, while retaining the remainder of the switchboard equipment, is shown not to have been always satisfactory. It is pointed out also that reliable bus-zone protective equipment, which isolates only the section concerned, is available, and that an auxiliary transformer connected directly to alternator terminals should be separately protected against excess current, possibly by a circuit breaker having a breaking capacity adequate to deal only with the short-circuit output of the alternator and interlocked to prevent its opening before disconnection of the machine from the busbars.

Unsuitability of varnished cambric tape for covering high voltage conductors was demonstrated by four burning injuries to persons touching it. Several serious accidents (exemplified) during maintenance of high voltage switchgear are attributed to mistakes in preparatory earthing procedure, which is not covered by many permit-to-work cards.

For power operated hand tools the supply voltage should be reduced to 110 with earthing of the centre point of the

* " Electrical Accidents and their Causes, 1951." Form 929. Factory Department, Ministry of Labour and National Service. Pp. 76; plates 4; figs. 6. H.M. Stationery Office, Kingsway, London, W.C.2. Price 3s.





Left: Damage to transformer after short-circuit caused by cat and (right) result of flash-over at insufficiently rated factory fuseboard

secondary winding of the transformer or to still lower voltage to meet special risks, as inside boilers or tanks. Particulars with circuit diagrams are given of recently developed protective schemes for portable apparatus. One of these is combined differential current and voltage operated earth-leakage protection by means of a tapped relay coil, the impedance of the two sections being adjusted to suit the characteristics of the current balance and voltage features, limiting leakage to 40 mA; a supplementary earthing connection to a separate electrode is required. In a second method a voltage-operated earth-leakage circuit breaker is connected in parallel with the solid earth to an electrode at a suitable distance from it; a pilot wire is necessary to provide a closed circuit for monitoring current from a small transformer, interruption of the circulating current causing the switch to open. Alternatives described are: a simple circulating current system (not usually to be recommended); a circulating current system with voltage-operated earth-leakage circuit breaker; the use of an isolating transformer with voltage operated earth-leakage circuit breaker; and a circulating-current system with silicon carbide element to limit voltage rise during the first half-cycle. The merits and limitations of the various methods are described.

Precautions necessary in inflammable atmospheres are discussed under the following headings: Exclusion of electrical apparatus from the danger area; enclosed equipment supplied with air or inert gas under pressure; flameproof apparatus, certified as complying with B.S. 229; " intrinsically safe circuits " in which a limited amount of electrical energy is insufficient to ignite an inflammable or explosive mixture, which may provide the most economical or sometimes the only solution. Regarding the last-named, it is stated that this country has been responsible for much of the basic research in classifying gases and their appropriate treatment through E.R.A. and the Safety in Mines Research Establishment. Investigations are still incomplete, but during the year under review a certificate was issued for the first time for hydrogen or gases of the class which it represents. Examples are also given of applications of intrinsically safe principles covered by certificates of the Chief Inspector of Factories.

Aluminium sheathing for v.i.r. cable has been found more durable than other metals in many situations if installed by skilled men and if precautions are taken against corrosion, particularly at junctions between dissimilar metals. Reference is made to the system of wiring developed for concrete buildings, in which reinforced rubber hose, designed for inflation to a slightly larger diameter, is embedded in the concrete during pouring; when the concrete has set the tube is deflated and removed, leaving a duct for cables.

An important section of the report relates to shock and fire hazards with old installations, especially in regard to persistent earth leakage of currents too small to blow fuses or trip circuit breakers. Other matters dealt with include arc lamps, testing radio and television sets, electrochemistry, cranes, welding, cellulose spraying, static electricity, fire alarms, aircraft installations, and electrical maintenance as a career. An appendix relates to revision of memoranda by the Senior Electrical Inspector of Factories on the Electricity Regulations (Form 928) and on Electric Arc Welding (Form 329). A second appendix lists the certificates issued by the Chief Inspector of Factories for electrical apparatus used in specified atmospheres.

THE 1954 POWER CONVENTION

THE promotion of the development of the home and overseas markets for electricity and electrical appliances is to be the theme of the sixth British Electrical Power Convention to be held at Eastbourne from 14th to 18th June. Delegates from 37 electrical organizations from all parts of Great Britain, Northern Ireland, Isle of Man and the Channel Islands, will meet in the Winter Garden, under the presidency of Mr. J. R. Beard, C.B.E., M.Sc., M.I.C.E., M.I.E.E., F.A.I.E.E., who represents the Association of Consulting Engineers.

It is claimed that this year's Convention exhibition will be the largest and most comprehensive ever staged outside London, with the possible exception of the B.I.F., Birmingham. It will be housed in a marquee covering 24,000 sq ft of the Winter Garden grounds, within 200 yd of the Convention meeting place. The exhibition area is about 20 per cent greater than at last year's Convention at Torquay. The exhibition will be officially opened on the evening of 14th June by the President. The Convention and Exhibition should be attended by some 2,500 people.

The preliminary programme provides for the opening of the Convention on Tuesday, 15th June, with a civic welcome from the Mayor of Eastbourne, followed by the presidential address. After the annual luncheon of the Electrical Association for Women at the Grand Hotel, the Convention will resume in the Winter Garden when a paper on " The Market for Electrical Appliances and the Interdependence of Home and Export Trade " will be presented by Sir George Nelson, F.C.G.I., M.I.Mech.E., M.I.E.E., British Electrical and Allied Manufacturers' Association. In the evening the delegates and their ladies will be the guests of the Mayor and Mayoress of Eastbourne at a reception in the Winter Garden.

The proceedings on the Wednesday will be of particular interest to women. Mr. W. J. Jones, M.Sc., M.I.E.E., director of the Electric Lamp Manufacturers' Association, will speak on " Modern Lighting for Industry, Commerce and the Home," and Dame Caroline Haslett, D.B.E., J.P., Companion I.E.E., director of the Electrical Association for Women, will deal with " Electricity in the Modern Home." Both these talks will be accompanied by demonstrations.

On Thursday, 17th June, a paper entitled " The Development of the Domestic Electricity Load at Home and Overseas " will be given by Mr. D. Bellamy, O.B.E., D.L., Companion I.E.E., chairman of the Yorkshire Electricity Board. In the afternoon, Mr. S. L. M. Barlow, Associate I.E.E., M.A.I.E.E., president of the Electrical Contractors' Association, will speak on " The Comparison of Installation Practice at Home and Overseas." The Convention dinner at the Grand Hotel and dancing at the Winter Garden will conclude Thursday's proceedings.

On Friday morning two hours will be given to an " Electrical Forum " when questions will be answered by a panel of experts with the President acting as " question master." This will be followed by the annual general meeting, at which officials for the next year will be elected and the venue for the 1955 Convention decided.

Contracting Industry Dispute

Threat of Further Strike Action

IT will be recalled that in August and September the Electrical Trades Union authorized strikes at a number of sites where its members were employed by electrical contractors. This action was taken in an endeavour to force the employers, members of the National Federated Electrical Association, to grant a " substantial " increase in wages.

The dispute was referred by the Minister of Labour and National Service to a Court of Inquiry which after hearing both parties came to the conclusion that an early meeting of the National Joint Industrial Council for the Contracting industry should be called and "an earnest endeavour made by both sides to resolve outstanding differences and especially whether the present wage claim shall be solved on the basis of the cost of living index, and if so whether the datum line for assessing that claim should be June, 1947, January, 1948, January, 1952, or some other acceptable starting point." The report was dated 6th October.

A meeting of the Standing Committee of the N.J.I.C. was held on 10th November when the N.F.E.A. made a statement showing why an increase of wages was not justifiable. The E.T.U. raised points which were replied to. A few days later there was an informal discussion between Mr. L. C. Penwill, director of the N.F.E.A., and Mr. W. C. Stevens, general secretary of the E.T.U., when the latter suggested that a settlement might be reached without resort to arbitration but was told that there was no other way out of the deadlock.

At a full meeting of the N.J.I.C. on 9th December the E.T.U. moved a resolution claiming a substantial increase in wages. The N.F.E.A. countered with an amendment for referring the matter to arbitration and no decision was reached. There was a further meeting between Messrs. Penwill and Stevens on the 18th December when the former made suggestions which Mr. Stevens promised to consider. On the 20th December a letter was received from the E.T.U. saying that unless they heard further from the N.F.E.A. they had decided to authorize strike action on various sites. To this the N.F.E.A. replied urging the reference of the dispute to the Minister of Labour for arbitration.

Because the Union's letter was construed as a notice authorizing strike action an emergency meeting of the Council of the N.F.E.A. was called for Tuesday last.

In the meantime the Ministry of Labour has interviewed representatives of the Association and the Union. Last week-end Mr. F. L. Haxell, assistant general secretary of the E.T.U., said that no final decision had been taken although provisional plans had been made for a series of strikes culminating in a complete 24-hour strike on 18th January. While it was the policy of the Union to reject arbitration in the present circumstances it did not follow that arbitration was entirely excluded. They were willing to meet the employers again at the request of the Ministry but the continued refusal of the employers to make an interim offer could obviously not provide a basis for negotiation.

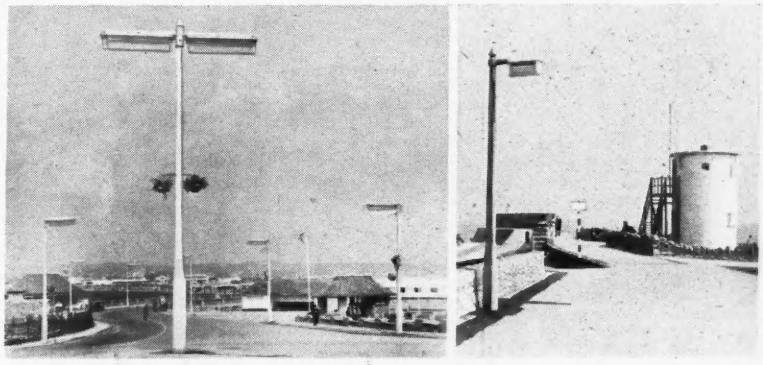
On Monday the general president of the E.T.U. (Mr. F. Foulkes), with Mr. Haxell and Mr. R. McLellan, a member of the executive committee, met Ministry officials. After a discussion lasting nearly two hours Mr. Foulkes said that the talks had not affected the Union's decision.

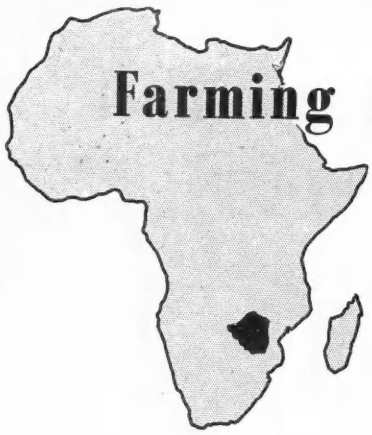
In a statement made on the same day Mr. Penwill said that on four separate occasions the N.F.E.A. had offered arbitration, verbally and in correspondence. In particular he referred to a very plain offer contained in a letter sent to the Union on 30th December.

SEAFRONT LIGHTING

PORTHCAWL, which is becoming known as the conference town of Wales, has added to its amenities by building a two decker sun-trap esplanade and installing fluorescent lighting on the eastern, central and western promenades. This covers almost the whole of the town's seafront. The new lighting was planned jointly by the Town Council and the General Electric Co., Ltd. On the columns (supplied by Concrete Utilities, Ltd.) special finials combine attractive appearance with reinforcement of the brackets against strong winds. Spade roots were used so that underground obstructions could be avoided. The 73 G.E.C. " Three-Eighty " lanterns each house three 5ft 80 W " Osram " warm-white tubes and auxiliaries. The tubes are carried in specially positioned clips so that no focusing is necessary. The lantern body consists of a steel framework covered with aluminium sheet specially treated to resist corrosion. A non-porous sponge rubber gasket between the body and the bowl is an added defence against bad winter weather. Unplasticized " Perspex " bowls fitted with sealed " Perspex " refractor plates give a light and clean appearance to the units by day, and uniform brightness by night. Six smaller fluorescent lanterns (" Two-Forty ") are installed around the miniature golf course, between the centre and eastern promenades. The accompanying illustrations are published by courtesy of Mr. A. C. Rees, engineer and surveyor to the Porthcawl Council.

New fluorescent lighting installation at Porthcawl. On the right is one of the smaller fittings the design of which blends with the stone jetty, look-out tower and harbour light





Farming in Southern Rhodesia

Extent of Electrification

By J. G. NEVILLE

Rural electrification is often difficult enough in this country but such work is far more expensive and onerous in the wide expanses of Southern Rhodesia. Here the population density is rather less than one inhabitant per square mile. Nevertheless the Electricity Supply Commission had connected by last March 1,900 of the 5,500 farms in its area and is actively encouraging the fullest use of electricity

FOR anyone unfamiliar with the vast distances encountered in Southern Rhodesia and the low density of population, it is first necessary to give some general statistics. The total area is 150,333 sq miles, of which approximately 104,000 sq miles is open for settlement by the European. The total European population is 152,000 and over 70 per cent is settled in the areas supplied by the municipal electricity undertakings of Salisbury, Bulawayo, Gwelo, Umtali, Gatooma, Que Que, Fort Victoria and Selukwe. The remainder of the population mostly falls within the area served by the Electricity Supply Commission of Southern Rhodesia, which has been faced with the onerous task of supplying as many consumers as possible in an area having a density of population of far less than one person per square mile.

There are about 5,500 farms in the Colony and it is important to note that the definition of a farm for the Commission's statistics is an area of land in excess of 50 acres and where the occupier holds a farmer's licence. It is difficult to state the exact average size of farms as most statistics available include ranches which can vary in size from 10,000 to 300,000 acres. It is probable, however, that the average is something like 2,000–2,500 acres.

Very briefly, then, these are the existing conditions, and the problem of rural electrification has been tackled with considerable vigour by the E.S.C.; 1,900 farms had been connected to the 11 kV system by the end of March, 1953.

The types of farming are principally tobacco, maize, mixed (dairy, pigs and maize or dairy and tobacco), with a number of poultry farms and, of course, ranching. Each type has definite electrical characteristics and the fact that the annual rainfall is confined to the months of November to March necessitates many large-scale irrigation projects.

The use of electricity on a specialist tobacco farm is limited to domestic requirements, water pumping and yard lighting. This season, however, has seen the development of a new tobacco curing technique which is making use of a $\frac{3}{4}$ h.p. fan for air circulation in the curing barn. Preliminary tests indicate that a consumption of 80 kWh per curing over seven days can be expected, and since most tobacco farmers have at least six barns and the curing extends over the months of January to April, there is hope for an extended use on this type of farm. Electrical curing has been successfully carried out but the high cost of installation, both for the Commission and the farmer, does not hold out much hope for an early development of this type of load.

The African natives constitute the farm labour force and since their staple food is ground maize or mealie meal, the demand for maize mills of the hammer type is almost universal. During the past three years, great strides have been made in encouraging the use of the 3 h.p. automatic hammer mill and after overcoming much of the prejudice of farmers who have been used to tractor-driven 20 and 30 h.p. mills, the extended use of this apparatus is at last becoming apparent.

On the large maize producing farm, which also feeds upwards of 500 head of cattle, there is little prospect of this equipment being connected since many farmers require a hammer mill capable of grinding maize on the cob for cattle feed. The trend is also towards overhead silos for ensilage and the existing cutters with blowers attached require 15–20 h.p.

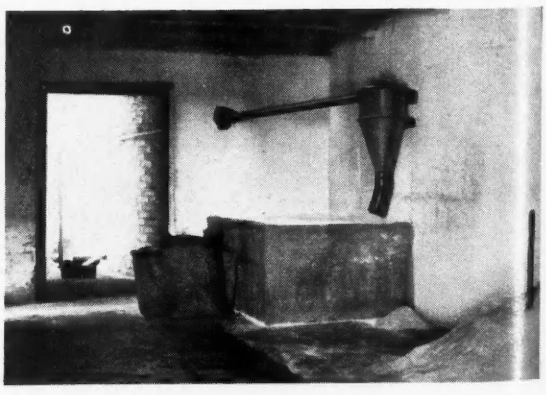
On the smaller mixed farm, however, much has been done to enable smaller motors to be used and a 5 h.p. portable motor is able to deal with maize shelling, ensilage cutting and small plots of irrigated crops such as vegetables and lucerne.

Since no piped water supplies are available outside the towns and villages there are boreholes and wells on every farm. A recent drive has resulted in thousands of dams being constructed throughout the farming areas.

The main crops under irrigation on the average farm are lucerne, napier fodder and vegetables. From the supply point of view, however, all this irrigation takes place during the dry season or winter, which is the peak load period. In addition it is only required for a maximum of six months of the year.

Some tobacco farmers are now trying to plant out their

Automatic hammer mill installation (3 h.p.)



Transformer point on a Southern Rhodesian farm and (right) " Rainbird " spray in action

tobacco earlier than usual and irrigating for four to six weeks in late October and November until the normal rains commence. It is certain that the irrigation load will expand considerably.

As is usual with most rural electrification schemes the dairy farmer offers the greatest scope for development. The high ambient temperature makes milk cooling essential and the cabinet type cooler is almost universal. Some suppliers provide the farmer with designs to enable him to construct a sunken tank type himself and so save on capital costs, but the majority of coolers are of the 80 to 120 gallon cabinet type.

In the past two years electrical sterilizing has become accepted as the best method and gradually the wood-fired boilers are being dispensed with. Dairy regulations follow much the same pattern as in Great Britain and a few farmers have installed modern auto-recording releaser plants in conjunction with a 20 kW floating electrode boiler.

One type of storage block sterilizer has recently been tested and has proved completely satisfactory but great care has to be exercised in introducing any new or different equipment since in most cases it is operated by raw native labour without the slightest idea of how things work. It is very necessary to ensure that all the plant is as simple as possible and gradually the benefits of automatic control are being appreciated. The native farm worker can no longer be looked upon as " cheap " labour and this again is helping to encourage the extended use of the supply.

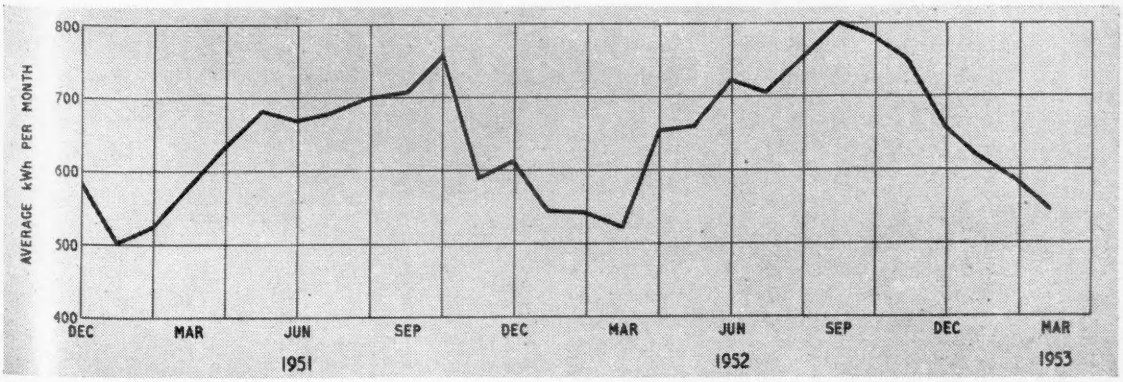
The farm workshop on the Southern Rhodesian farm is rapidly developing, helped by the distances which separate the farmers from the nearest agent or machine shop. It is no exception for a farmer to have to travel over 50 miles for a simple weld and although there is little benefit to the E.S.C. many 5 kVA 380 V welders are being installed and some remarkably well-equipped workshops are connected to the system. The workshop on Lord Acton's farm, M'Bebi, includes a welder, lathe, forge blower, grinder, stand drill and portable drill. Other consumers with six or more tractors and several lorries and cars are installing electrically heated oil filters.

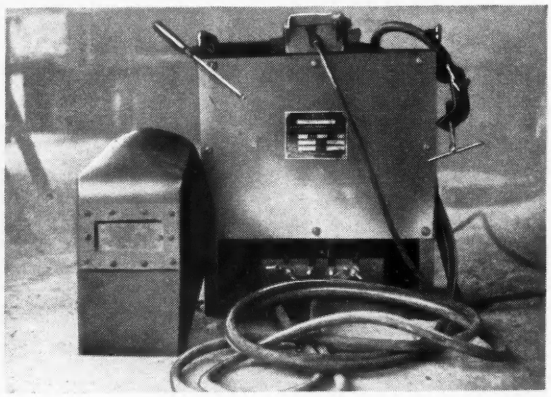
On the poultry farms the infra-red-ray lamp is fast supplanting all other methods of brooding for, notwithstanding the warm climate, evenings and mornings can be very cold and the lamp encourages such a quick feather growth that sexing can be carried out much earlier.

Crop drying is in its infancy and so far there are only three grass dryers in existence in the Colony either coal or oil fired. This year, however, experimental work has commenced with barn hay curing and the results so far achieved indicate that there should be great possibilities with this load. It is hoped that this can be developed during the off-peak periods from November to March with considerable advantage.

One all-electric mint-curing installation exists where there are two barns each with 30 kW of heating equipment. This installation when working to full capacity consumes

Average monthly farm consumption





Farm welder (5 kVA, 380 V)

15,000 kWh per month. Particular attention is drawn to the heat exchanger which was designed by engineers of the E.S.C. and has since been copied by British manufacturers.

Distances also make it extremely difficult for farmers to obtain reasonable prices for installation work. Although the Southern Rhodesian farmer is probably the most versatile type in the world and does much of his electrical work himself, this fact does affect development as there are many cases where the overhead lines forming part of the consumer's installation can cost up to £1,000.

The drop in consumption during the months of November to April is entirely due to the rains. There is little water pumping necessary, practically no irrigation, no maize shelling, no ensilage until January or February, and a general lowering of domestic requirements during these hot months.

On the domestic side most farms have considerable quantities of wood and until the wood-fired cooker wears out or falls to pieces there is a reluctance to replace it by an electric one. It must also be remembered that most of the cooking is done by the native cook-boy and the farmer does not have to cart the wood or chop it—this is all done by the native.

The water heating load is developing very slowly but here again a 44 gallon petrol drum outside the bathroom fired by wood is a strong competitor, although it is very wasteful in fuel. The refrigerator, on the other hand, is in practically every home and after water pumping is usually the first requirement.

One of the larger types of mixed farm is owned and operated by Mr. E. R. Campbell, president of the Southern Rhodesia Tobacco Association, at Zunidza, Inyazura. This farm is 3,500 acres in extent, of which 1,400 acres is arable. Crops consist of 100 acres of tobacco, 75 acres grain maize, 150 acres for ensilage, 220 acres of improved pastures, 70 acres of green crops, 40 acres are under irrigation for lucerne, green oats and potatoes, and 70 acres of sun hemp hay is grown. Besides growing tobacco, all of which is cured and graded on the farm, Mr. Campbell keeps a herd of 550 Hereford-crossed Afrikaner cattle for beef. A herd of six dairy cows provides milk, butter and cream for Mr. Campbell's household and his four European assistants. The native staff consists of 72 farm boys and seven domestic boys. Four dams have been constructed on the farm, which hold 38·5 million gallons of water.

The whole of the electricity supply is centrally metered at the base of the Supply Commission's 50 kVA three-phase 11,000/380 V transformer, and the whole of the l.v. network is owned and maintained by the consumer.

The electrical equipment installed includes nine pumps (totalling 30 h.p.), a workshop motor (20 h.p.), a 5 h.p. mill, a 3 h.p. conditioning fan, a 1½ h.p. compressor, a 3 kW welding set, a number of fractional h.p. motors and domestic and hospital equipment. The average monthly consumption during last irrigation season was 7,920 kWh; the average monthly consumption for the year was 7,128 kWh; the highest monthly consumption was 9,158 kWh and the lowest 4,444 kWh.

Acknowledgment is due to the Electricity Supply Commission for statistics and general information.

Revised Bulk Supply Tariff

THE British Electricity Authority has given notice of a revised tariff for the supply of electricity to Area Boards, to come into force as from 1st April next. As hitherto, the tariff incorporates a fixed charge per kW of maximum demand and a running charge per kWh consumed, applying on a uniform basis to all Area Boards and subject only to regional fuel cost adjustment. Overall the Area Boards will pay approximately one per cent more for their supplies under the new tariff, but the incidence of this increase on individual Boards will vary.

The kW demand charge has been raised from £4 5s 6d to £4 15s to reflect increased capital charges and other fixed costs, while the running charge, with its associated fuel price variation, has been reduced to reflect the continuing improvement in thermal efficiency. A figure of 60s (instead of the present 38s) has been adopted in the new tariff for the basic cost per ton of fuel as being more in keeping with the current price levels, and the basic running charge is consequently revised from 0·33d to 0·5d/kWh. The fuel price adjustment figure is reduced from 0·0007d to 0·000065d per penny variation in the cost per ton of fuel in the respective Areas. The tariff provides that the fuel cost per ton in any period shall be determined as follows:—

> "The total cost of fuel consumed in the period at all the Central Authority's stations in the Area of the Area Board taking the supply shall be divided by the total number of tons of fuel so consumed and the cost per ton so obtained shall be multiplied by 11,000 and divided by the average gross thermal value of the fuel so consumed expressed in British Thermal Units per lb."

The demand will be measured on weekdays between the hours of 7 a.m. and 7 p.m. from Monday to Friday and 7 a.m. to noon on Saturday. If the demand so measured is exceeded by the demand at other times there will be no additional charge. Thus the new tariff affords further encouragement to Area Boards to develop off-peak loads and so improve the national load factor.

Shoe Manufacture

Change-Over to Individual Drive at a Northampton Factory

A FIVE-YEAR plan of modernization and re-equipment just nearing completion at J. Sears & Co.'s True-Form shoe factory at Northampton has permitted production to be stepped up to a potential of approximately 36,000 pairs of boots and shoes each week, covering ladies' and men's medium welted styles, all types of boys' and youths' shoes, and footwear for the Army, Navy and R.A.F., as well as special bespoke orders and surgical footwear. The increased production has also enabled a much larger proportion of goods to be made for export to markets all over the world.

Apart from improvements to the lighting, the installation of three dust extraction systems and the provision of battery driven trucks, signalling systems and accounting equipment, the scheme of improvements has involved the entire change-over of the shoe-making machinery from belt to individual electric drive. This conversion is now virtually complete.

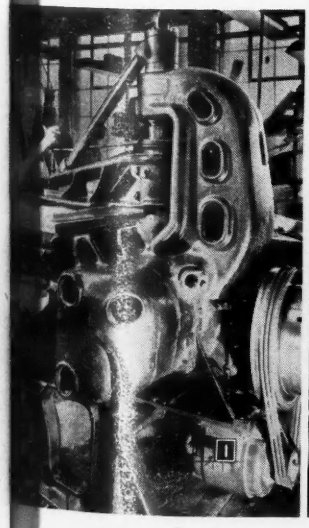
The type of machines employed in shoe-making lend themselves particularly well to individual electric motor drive for they are almost without exception, compact, self-contained and in operation intermittently. In the cutting room the soles are cut from leather or rubber by means of twenty-two revolution presses and the insoles and heel lifts by eight double-ended presses which are designed so that an operator can work each side. The machines are flywheel operated, a flat belt drive being taken in each case from the flywheel direct to the pulley of the 2 h.p. 940 r.p.m. protected type motor which is mounted on a fabricated frame bolted to the top of the machine head.

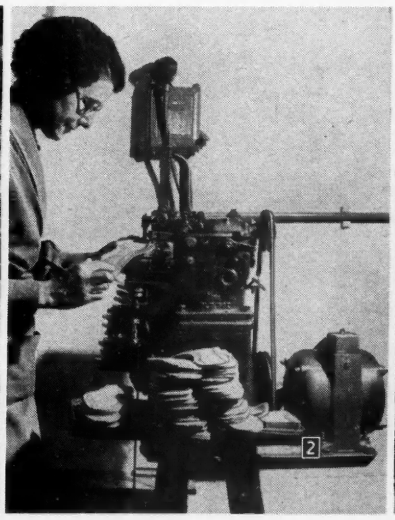
An interesting feature of the electricity supply arrangements here and in several of the other developments is the use of a neat overhead conduit system with B.I.C.C. connection boxes at intervals into which Reyrolle four-pin plugs can be fitted to supply the individual machines, each point being protected by a separate Reyrolle switch-fuse. This arrangement greatly facilitates replanning of machines to secure production flexibility, as well as being useful for general maintenance.

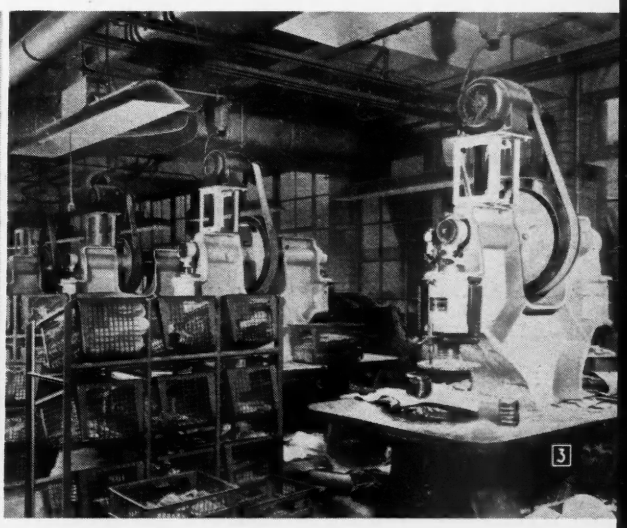
A further line of presses of a different type used for cutting several thicknesses of vamp linings has 3 h.p. motors mounted underneath the machine frames, the supply in this case coming from Reyrolle switch sockets connected to the trunking system which is carried along the walls at a height of about 18in. After being cut, the soles and insoles are graded, and made even by abrasion, stamped and then automatically sorted according to thickness, the "iron," 1/48th of an inch, being the unit of measurement adopted.

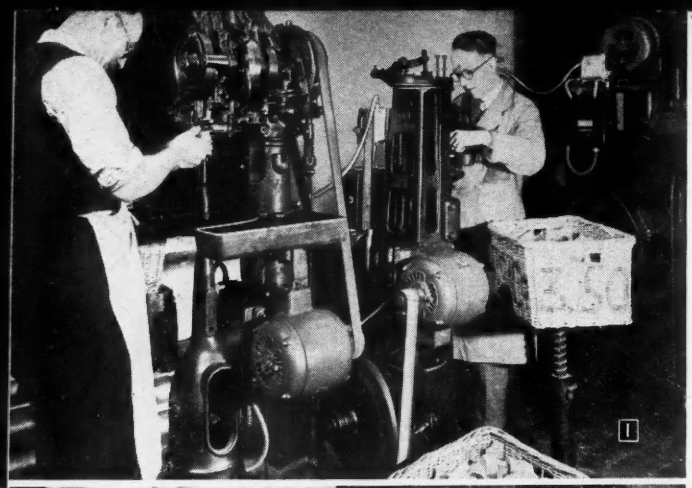
Heel lifts, previously assembled into packs of the required height, are prepared in a third type of press, the heel building and compressing machines, where they are nailed together and shaped. For these machines 1½ h.p. and 3 h.p. motors with direct-on-line starting are employed.

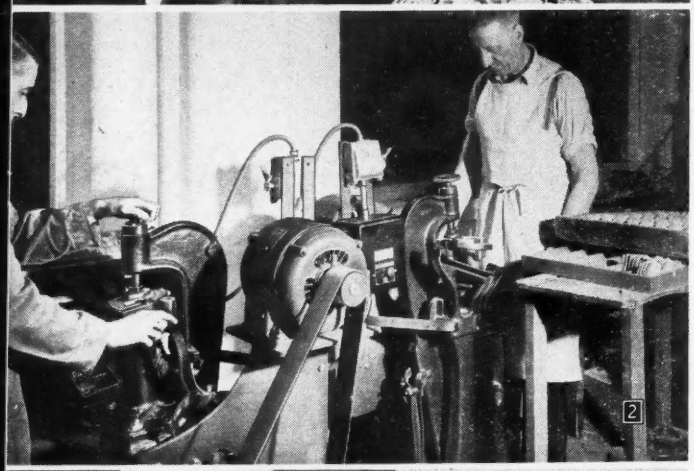
Above: Shoe room showing fluorescent lighting. Below: (1) Presses, cutting vamp linings, driven by 3 h.p. motors. (2) Double-lip turning machine raising a "wall" on the insole. (3) Cutting heel lifts on double open end presses

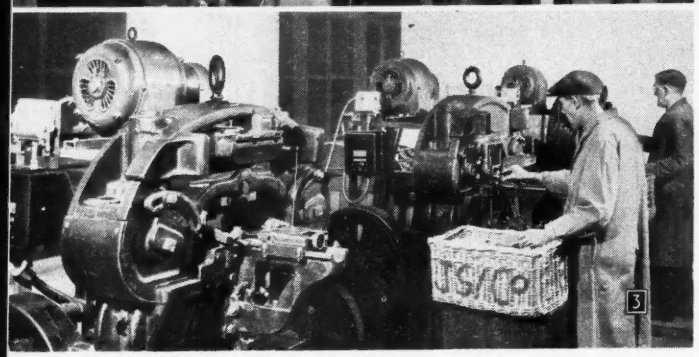












The top pieces of the heels are fixed on a slugging machine and the completed heels attached to the shoes are then passed to the heel breaster which cuts and shapes the front portion: each of these machines is driven by a 1 h.p. motor.

On leaving the sorting section the insoles pass on for preparation. After rounding they are grained and channelled. Scoring follows and the toes are snipped. Latex is applied to the channels and the lips are turned back and stuck. In some cases canvas is used for strengthening purposes. For all these processes machines individually driven by motors of 1 or 2 h.p. are employed.

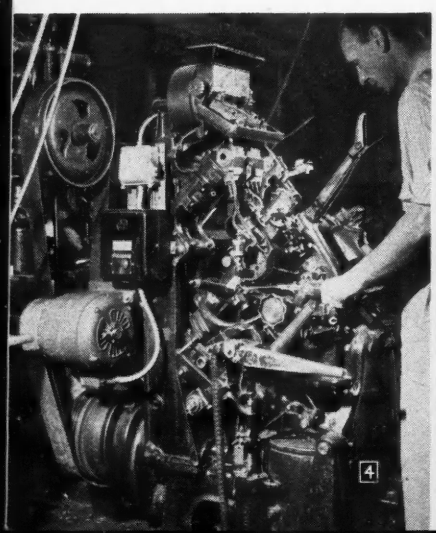
In the clicking room where the materials for the uppers are prepared the leather is cut to required shapes either by hand or by presses operated by 1 h.p. motors. An embossing press installed comparatively recently enables decoration by perforating and gimping to be carried out three times as fast as by methods previously employed, besides permitting embossing, previously impracticable. In this machine the leather is heated during treatment by two 220 W elements.

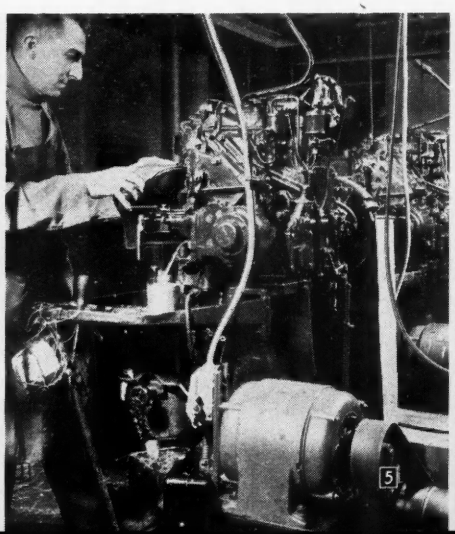
The change-over of the closing room, where the uppers are actually made, to individual drive was finally completed only a few weeks ago. Mounted on a 3in by 3in trunking system running 1ft above the ground are 10 A switch-fuses (Bill) serving 206 socket-outlets (Light & Power Accessories) from which the Singer machines on benches placed on each side are fed. The electricity supply to the switch-fuses comes from four 8-way (Bill), distribution boards between five and ten switch-fuses being on each circuit. Four-pin plugs (L.P.A.) with metallic leads are employed to connect up the machines on the benches which have Allen West starters bolted on. Each machine now has its own $\frac{1}{3}$ h.p. motor which represents a considerable saving in electricity consumption since previously a 3 h.p. motor constantly in circuit was required to drive a group of 10–12 machines. The new arrangement also fits in better with the batch system adopted in this department, involving the use of trolleys each containing forty-eight pairs of uppers.

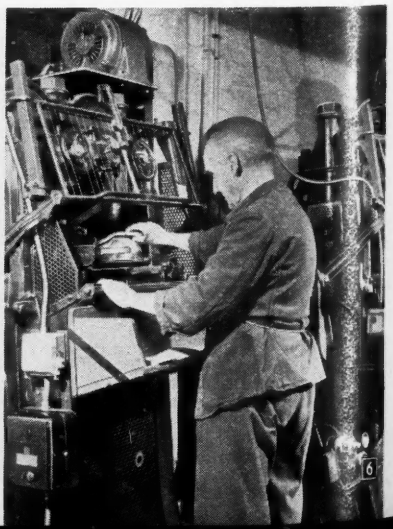
To illuminate the needles of the machines used in the closing room special Cryselco 6 V 20 W pear-shaped bulbs are employed, fitted in E.D.L. brackets and supplied through tappings off motors.

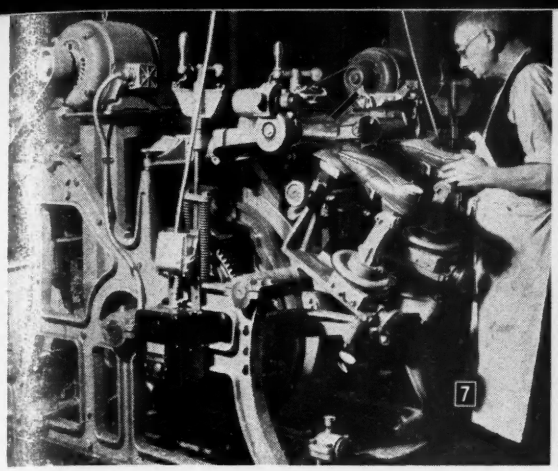
Overhead conduit with plug-in connection B.I.C.C. fuse boxes is employed in the making room where the insoles (now attached to lasts), the uppers and soles come together for assembly. The toe puffs and stiffeners are inserted

(1) On the left is the heel slugger machine and on the right the heel breaster. (2) Forming heel lifts to shape and nailing them together are operations carried out by this machine. (3) A 3 h.p. motor drives this machine which moulds built heels under pressure. (4) Fitting the closed uppers to the lasts. (5) Sole stitching machine for attaching the sole to the welt. (6) Conforming the soles to the bottom shape of the last









and the back of the upper is attached to the last. Pull-over machines then fit the uppers to the lasts by means of seven tacks inserted in one operation. Side stapling is followed by toe lasting which, with the aid of copper wire and tacks, determines the shape of the toe.

Seat lasting fixes twenty tacks to the heel seat of the shoe and the waste upper material is later trimmed off. All the tacks are removed except the two securing the copper wire. The welt is then sewn to the lip of the insole channel and the seam is trimmed. The remaining nails are removed and the welts are skived. A compound of cork and resin, heated electrically, is applied in the bottom filling machine and the seat lifts and shanks are inserted.

Soles are first temporarily attached by solution to the bottom of the shoe with the aid of sole laying machines. In the case of the lighter type of leather soles, a channel is opened in the sole through which it is stitched to the welt. The sole is then ready for bottom levelling, tandem machines enabling a completed pair of shoes to be treated at the same time.

After drying (the soles are damped sufficiently to make them flexible before they are fixed on), the shoes go to the finishing room where the heels are attached and the lasts removed. The remaining processes are concerned with trimming, staining, waxing, polishing, decorating, marking, inserting socks and packing.

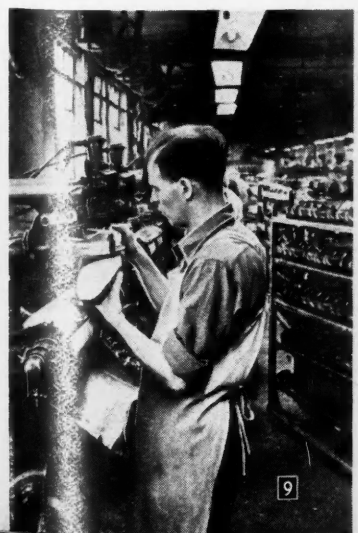
All the new motors installed in connection with the change-over to individual drive, ranging from $\frac{1}{3}$ h.p. to 3 h.p., were supplied by Brook Motors, Ltd., most starters for the fractional h.p. units being made by Allen West, Ltd., and those for the larger motors by the Midland Electric Manufacturing Co., Ltd. A large amount of Brook control gear is also in use in the works on the machines forming the heel lifts, the nailing machines, heel slugging and heel moulding machines, as well as on the machines which conform the soles to the bottom shape of the last, on the machines for fitting closed uppers to the last, and on the sole stitching and bottom levelling machines. With the self-contained machines previously in use, the production equipment now comprises about 700 motors totalling approximately 700 h.p.

The electrical installation, which has a maximum demand of 410 kVA, also comprises three British United dust extraction systems driven by 30, 25 and 20 h.p. motors, Matthews & Yates ceiling fans, seven lifts (six Express and one Evans), two Kings cranes and an elevator for bringing the empty racks from the finishing room to the preparing room, Austin Crompton battery trucks, electric clocks (mostly " Sectric "), International Business Machines time recorders and programmer, Dictograph internal telephones, a G.E.C. public address system with seventy loudspeakers, and a Powers Samas accounting system.

Virtually the whole of the factory is now equipped with fluorescent lighting. The installation was carried out with 894 reflector fittings made by the General Electric Co., Ltd., and housing 5ft 80 W " daylight " tubes. The electrical contractors for the installation of the lighting in the making room and public address systems were the Electrical Equipment Co. (Leicester), Ltd. The remainder was planned and carried out by J. Sears & Co.'s own staff.

We thank J. Sears & Co., Ltd., for permission to inspect the electrical installation and Mr. F. W. Barker, and Mr. W. G. Church, chief electrical engineer, for the help given to us in the preparation of this article. The photographs were supplied by Brook Motors, Ltd., and the General Electric Co., Ltd.

(7) Shaping the bottom of the shoe to take the bottom shape of the last. (8) Finishing department, heel attaching. (9) Finishing department, bottom scouring. (10) The brushing operation in the shoe room. (11) Fluorescent lighting in the packing department



GENERATION AND DEVELOPMENT

Shoreham Harbour Enlargement

WORK IS TO start shortly on the £1,750,000 improvement scheme at Shoreham Harbour, Sussex, which is being undertaken in conjunction with the British Electricity Authority. By lengthening the breakwater to 500ft, widening the entrance from 176 to 450ft and deepening the harbour by 5–6ft, it will be possible for colliers of up to 4,000 tons to use the port (against the present limit of 1,500 tons). When the new Southwick power station is completed it will use nearly a million tons of seaborne coal a year.

B.E.A. Contracts

Contracts have been placed by the British Electricity Authority during the past month for power stations amounting in the aggregate to £7,081,127. The principal contracts include the following:—

Barking "C" power station: One 540,000 lb/hr boiler.—Babcock & Wilcox.

Brighton "B": Structural steelwork.—Redpath Brown & Co.

Marchwood, near Southampton: High pressure steam and feed pipework and valves.—John Thompson Water Tube Boilers.

East Yelland, near Barnstaple: Two 36 MVA generator transformers.—C. A. Parsons & Co.

Willington, near Derby: Four booster and four boiler feed pumps.—Mather & Platt.

Lincoln: Four 120,000 lb/hr boilers.—Richardsons Westgarth & Co. Two 20,000 kW turbo-generators, condensing and feed heating plant. — Brush Electrical Engineering Co.

Meaford "B," Stone, Staffs: One 72 MVA generator transformer.—British Thomson-Houston Co.

Ferrybridge power station, Yorks: Two 760,000 lb/hr boilers.—Stirling Boiler Co.

Mexborough, Yorks: Three 180,000 lb/hr boilers.—Richardsons Westgarth & Co. Condensing and feed heating plants for two 30,000 kW turbo-generators.—English Electric Co.

Portobello, Edinburgh: Foundations.—Melville, Dundas & Whitson.

Campaign Against Tariff

Mr. T. Edge, of the Merseyside and North-West Industrial Development Council, is leading a campaign to secure an alteration or abolition of Tariff VI of the Merseyside and North Wales Electricity Board. This is a maximum demand industrial tariff. He said in an interview that if the maximum demand was exceeded for perhaps only 10 minutes on the last day of the year the industrialist would get a bill for electricity on the basis that he had consumed at full capacity rate for the entire year. Mr. Edge is the general manager of a Widnes ironworks and a member of the National Association of Manufacturers. The reply of the Board is that there is sufficient flexibility in the eight tariffs and consumers could make their choice. Where it is not possible for the consumer to make an accurate forecast of his electricity requirements he could go on to a tariff calculated on a monthly basis.

Developments in the North East

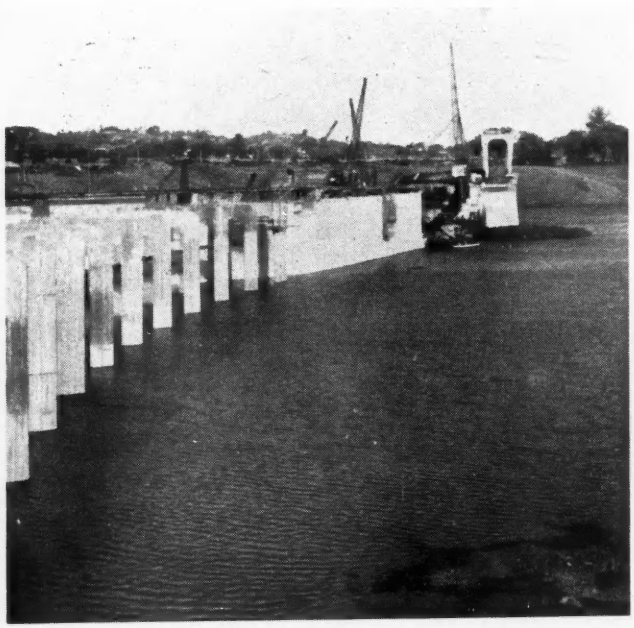
It is estimated that during 1953 electricity was supplied to another 33,000 consumers in the area of the North Eastern Electricity Board, an increase of about 8,000 on the 1952 figure. In addition, 430 substations were built and more than 400 miles of overhead and underground cables laid. This year the Electricity Board will carry out a further stage of its £1,250,000 rural electrification plan and another 100 villages will receive a supply at a cost of £500,000.

Water Heating Installations

Ilford Housing Committee reports that the Minister of Housing and Local Government has intimated that he will raise no objection to the provision and installation of immersion heaters in

OWEN FALLS

FOLLOWING the information in the last issue of the *Electrical Review* to the effect that the first turbo-alternator set of the new hydro-electric scheme of the Uganda Electricity Board was put into operation on 23rd December, we have now received the accompanying photographs of the scheme which were taken very recently. This first turbo-alternator is one of the ten similar sets which will give the hydro generating station a final capacity of 150,000 kW. The photograph below is a view of the River Nile looking upstream now that the level is 20ft short of the designed final level.



The immediate area in the foreground of the picture is the site of the original Owen Falls now submerged. This first stage operation level has enabled the first turbo-alternator set to be put into operation with the result that an expenditure of £1,000 per day on fuel oil will soon be saved by shutting down the diesel generating plant. Every effort has been made to reduce the cost of the fuel oil because this large expenditure has been keeping the electricity tariff at an undesirably high figure.

On the right is reproduced a view of the main dam as it is now, nearing completion. The main sluice gates on the

916 houses and flats on post-war estates at an estimated cost of £11,035.

Bristol City Council Housing Committee proposes to install water heaters for the bathrooms of some 8,000 pre-war houses.

Peak District Substation

The Development Committee of the Peak Park Planning Board has given consent to a proposal by the British Electricity Authority for the construction of a substation at Wigley-meadow Farm, Winster, Derbyshire. This is subject to the siting and design of the substation being satisfactory, together with the use of suitable materials, and the screening of the site by trees.

Cable Deterioration

Following a complaint by the tenant of a B.I.S.F. house erected some years ago by the Easington (Co. Durham) Rural District Council, that the power circuit had failed, the Council carried out an investigation which showed that the red insulation on one conductor had hardened to such an extent that it was useless as an insulator. A further survey has shown that half the B.I.S.F. houses might be similarly affected. The Council has taken up the matter with the Edison Swan Electric Co., Ltd., who made the cable. The company, after carrying out laboratory tests on the cable, came to the conclusion that the deterioration was due to interaction between the anti-oxidant and the dye in the red insulation. The cable concerned had been made in 1947 when manufacturers were suffering from an acute shortage of rubber compounding materials. The cable did not carry any maintenance guarantee, but the company was willing to replace free of charge any of the cables withdrawn during the next twelve months. The Council's surveyor (Mr. R. R. Lumsden) said it would cost between £5 and £6 per house to install the new cable and all the 336 B.I.S.F. houses would have to be examined to ascertain the condition of the cables.

Rutherford College Workshop Equipment

The Newcastle-on-Tyne Education Committee is to spend £3,630 on the installation of high voltage equipment at new workshops for Rutherford College of Technology. Messrs Gregory & Partners, Pilgrim House, Newcastle, have been appointed consultants for the work.

House Wiring at Poole

Poole Corporation has approved a scheme estimated to cost £4,319 for the installation of electricity in 58 houses at Fraser Road and Mossley Avenue.

Colliery Power Station Closed

The National Coal Board has closed its generating station at Shotts, Lanarkshire, which served adjacent collieries and workshops. The supply will now be obtained from the South West Scotland Electricity Board.

Electricity for Pre-War Houses

The Seaton Valley Council's surveyor (Mr. T. W. Burgess) is to prepare a scheme for installing electricity in pre-war houses at Seghill.

Jet Plane Hits Transmission Line

A jet aircraft struck the Austerfield-Gainsborough main transmission line of the Yorkshire Electricity Board near Bawtry on 29th December. Some 10,000 consumers in the Sheffield and Grimsby Sub-Areas were affected by the consequent break in electricity supply lasting about 40 minutes. It is believed that the pilot, who was killed, was trying to make a forced landing.

Spanish Plant Extensions

It is reported from Stockholm that the Asea Electric Works is to deliver seven 19,000 kVA generators and control equipment to the Unión Eléctrica Madrilena, Spain. They are intended for new stations to be built at Entrepenas, Buendía and San Juan.

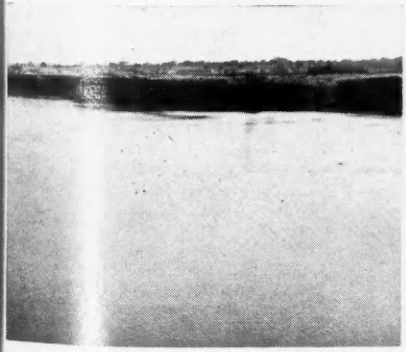
Irish Rural Plans

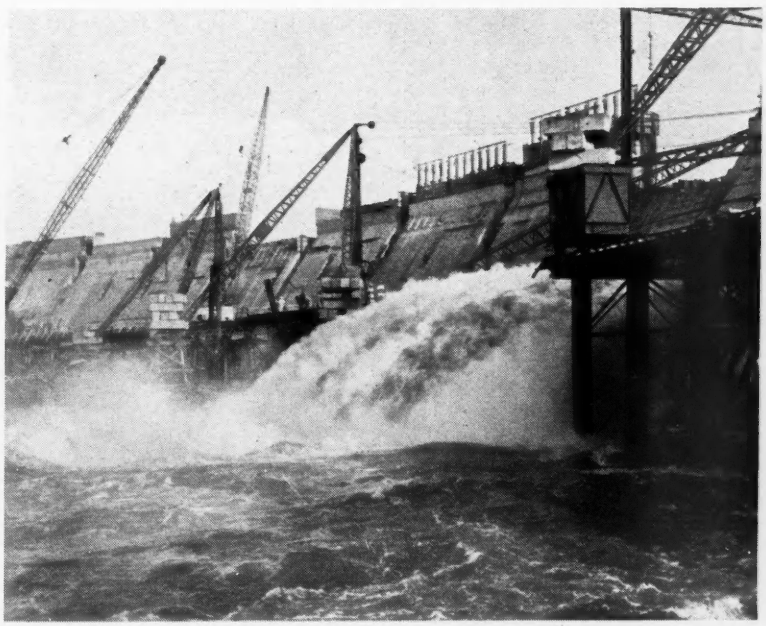
The Irish Electricity Supply Board has selected twenty new areas in ten counties for development under the rural electrification scheme. Work will start in all areas during the next few months as construction gangs now engaged elsewhere become available.

The Nile Hydro-Electric Scheme

dam are to the right; it will be from a staging immediately above the sluices that H.M. the Queen will perform the inauguration ceremony for the scheme as a whole in the spring. The view on the extreme left is of the supports of the road bridge behind the dam. The bridge proper will consist of prefabricated members which will be placed in position in a period of only ten days.

We are indebted to Mr. C. R. Westlake, M.I.E.E., chairman of the Uganda Electricity Board, for the opportunity to publish these photographs. Some general information on the Owen Falls scheme was published in the *Electrical Review* of 13th March, 1953.





Financial Section

STOCKS and SHARES

STOCK EXCHANGE markets got away to a fairly good start in the New Year, despite the cautionary influence of the industrial wages problems. There is no disposition to under-rate the serious possibilities which the latter include. At the same time, the state of markets suggests that a sober sense of optimism is kept uppermost on the strength of the progress shown in the latest production and overseas trade returns, and, so far as industrials are concerned, by anticipation of generally good company results for 1953. British Electricity stocks show little further change. The list of electrical equipment share prices is a little irregular, but contains a number of strong points.

Mixed Changes

The telephone group provided some of the best of last week's price changes, Automatic Telephone rising half-a-crown and Ericssons 1s 3d; both shares were among the leading performers during 1953. Aerialite added 9d to the previous week's rise of 1s, and others to show useful gains included Electrical Components, Johnson & Phillips, Metal Industries, Telephone Construction and Hoover. Plessey rose to new heights, and the radio group was generally cheerful, with advances recorded in Ekco, Cossor and others. British Electric Traction deferred are outstandingly good at 39s 6d.

Clarke Chapman

Of the companies which end their financial year with the calendar, Clarke Chapman & Co. are generally among the earliest in producing the results. Last time, the dividend, which takes the form of a single annual payment, was announced in February, along with the preliminary profits statement. It was raised on that occasion from 15 to 17½ per cent, while remaining in the highly conservative class, for it involved the distribution of only £44,000 net out of an available surplus of nearly £230,000. For many years the bulk of the earnings has been put back into the business on a similar scale. As a result, the total of reserves a year ago were just about treble the nominal amount of £480,000 ordinary capital. A present yield of under 5 per cent on the £1 shares at 70s 6d (a rise of 3s 6d on the week) does justice to an unusually strong financial position.

"Take Over" Cases

According to reports, the matter of "take-over" bids came up for discussion last month at the annual meeting of Joseph Lucas (Industries). The market is not disposed to take at all seriously any suggestion of a proposition of that kind in the case of the Lucas company. Most of last year's take-over situations arose from the existence of valuable freehold properties, and, as followers of the Savoy Hotel case know, from somebody's enterprising belief that they could be developed more profitably on different lines. It seems natural enough that electrical equipment companies

Week's Price Changes

Company or Board	Nom. Value	Middle price 4th Jan.	Week's Rise or Fall	Dividend Previous	Dividend Last	Yield %	1953 Highest	1953 Lowest
Gilt-edged Stocks						£ s d		
Brit. Elec. 1968/73	100	89½		3	3	3 7 0	90	83 11/16
Brit. Elec. 1974/77	100	88½		3	3	3 7 9	89	82
Brit. Elec. 1976/79	100	94		3½	3½	3 14 6	94⅞	88⅝
Brit. Elec. 1974/79	100	104	+⅛	4½	4½	4 1 9	104	99⅛
Overseas Electric Supply								
Calcutta Elec.	£1	19/6	−6d	6†	6†	6 3 0†	21/-	18/-
East African Power	20/-	22/-		7	7	6 7 3	25/-	20/9
Nigerian Elec.	£1	24/6		10	10	8 3 4	25/-	21/6
Palestine Elec. "A"	£1	16/6	+1/-	Nil	Nil	Nil	19/3	7/7
Perak Hydro-Elec.	£1	13/6		Nil	6	8 17 9	17/10	13/6
Equipment and Manufacturing								
Aberdare Cables	5/-	8/3	+3d	20	25	7 16 3*	8/9	7/4
Aerialite	1/-	11/6	+9d	88½	88½	7 13 9	11/6	8/1
Allen, W. H.	£1	50/-		15	15	6 0 0	51/-	42/10
Aron Elec. Ord.	£1	43/9		15	20	9 2 9	47/6	36/3
Assoc. Elec. Ord.	£1	42/6		20	20	4 14 3*	45/7	36/4
Automatic Tel. & El.	£1	63/9	+2/6	15	15	4 14 0	65/3	55/-
Babcock & Wilcox	£1	48/3	+9d	18	18	—	50/-	40/4
Baldwin, H. J.	2/-	4/3	+3d	20	20	9 8 0	4/1	3/-
Bakelite	10/-	23/6	+6d	—	12½	5 6 6	24/9	16/-
British Aluminium	£1	37/6	+6d	12	12	6 8 0	43/10	35/-
B.I. Callender's	£1	38/3xd		9	10	5 4 6	40/10	33/3
B.I. Callender's 6% Pref.	£1	25/-	−6d	6	6	4 16 0	26/3	23/-
British Thermostat	5/-	18/9		30	35	—	19/-	14/-
British Vac. Cleaner	5/-	11/3		25	25	11 2 3	16/6	11/-
Brook Motors	10/-	32/6		20	20*	6 3 0	37/-	27/10
Brush Ord.	5/-	4/-	−3d	10	4	—	5/4	2/11
A. F. Bulgin	1/-	3/3		30	30	9 4 6	3/5	2/6
Burco	5/-	11/9		35	35	7 9 0*	12/2	8/6
Chloride El. Storage	£1	48/9	−3d	15	20	4 2 0*	44/10	32/3
Clarke Chapman	£1	70/6	+3/6	15	17½	4 19 3	70/6	57/6
Cole, E. K.	5/-	23/9	+3d	25	25*	5 5 3	23/9	14/2
Cossor, A. C.	5/-	7/3	+3d	10	10	6 18 0	11/4	6/4
Crabtree	10/-	23/9		17½	17½	7 7 3	32/6	23/9
Crompton Parkinson Ord.	5/-	14/3	−3d	11½	20	7 0 3	16/-	8/7
De La Rue	5/-	13/-		35	Nil	Nil	14/6	6/3
Decca	5/-	37/9		112½	150	3 19 6*	37/9	17/6
Desoutter	5/-	16/3		16	18	5 10 9	17/6	14/3
Dewhurst	2/-	6/3		19	19	6 1 6	6/9	5/-
Dictograph Tel.	2/-	5/3	−3d	20	20*	7 12 6	5/10	3/10
Dubilier Condenser	1/-	4/-		28	25*	6 5 0	4/4	2/10
E.M.I.	10/-	11/6	−3d	12	8	6 19 3	15/3	11/6
Electrical Components	5/-	12/-	+1/-	20	20	8 6 8	12/-	9/3
Elec. Construction	£1	53/9		15	15	5 11 9	56/-	50/6
Enfield Cable Ord.	£1	17/6	+6d	7½	5	5 14 3	24/10	17/-
English Electric	£1	39/9	−3d	15	15	—	40/8	34/-
English Electric 3½% Pref.	£1	16/-	+6d	3¾	3¾	4 13 9	16/4	14/6
Ericsson Tel.	5/-	48/9	+1/3	22†	22†*	2 5 3†	48/9	36/-
Ever Ready	5/-	27/3		35	35	6 8 6	29/-	25/-
Falk Stadelmann	£1	38/3		15	15	7 16 9	44/3	38/3
G.E.C. Ord.	£1	38/9		22½	11½*	5 16 3	46/-	36/3
G.E.C. 6½% Pref.	£1	27/-		6½	6½	4 16 3	27/7	24/9
General Cables	5/-	16/3		30	30	9 4 9	17/-	14/9
Greenwood & Batley	£1	40/9		15	17½	8 11 9	41/6	38/-
Hackbridge Cable	5/-	12/3		20	20	8 3 3	13/-	10/4
Hackbridge & Hewittic	5/-	17/6		20	20	5 14 3	18/3	16/1
Hall Tel. Acc.	10/-	11/-		10	10	9 1 9	12/7	8/6
Heatrae	2/-	4/-		12½	12½	6 5 0	4/3	3/3
Henley's	10/-	16/-		20	10½*	6 11 3	19/4	16/-
Holophane	5/-	13/9		20	20	7 5 6	13/9	11/1

* After capital bonus. † Free of income tax.

The above quotations are based upon middle prices in the Stock Exchange Daily Official List.

and their shares should so far have escaped the attention of the "bid" specialists. At the same time, these events have at least stirred the interest of many investors in the real value of the assets underlying their industrial shareholdings, and probably made their contribution to last year's all-round improvement in industrial share prices.

No Bid

Presumably the question of bids was raised at the Lucas meeting, because the market value of the company's shares, and the rate of dividend, can be calculated to be covered exceptionally heavily by the modern value of the assets on the one hand, and by earnings on the other. The chairman is reported to have emphasized, in reply, the small value attached to the buildings and machinery of the business if divorced from the personal factor, the closest understanding being necessary between the producer of accessories and the industries which it supplies.

Taylor Tunnicliff Bonus

Bonus shares issued by Taylor Tunnicliff (Electrical Industries) are being dealt in at around 12s and will be available free of the 2 per cent transfer stamp duty until the end of the coming week. They result from a 100 per cent scrip distribution, involving the capitalization of £300,000 of the reserves, and the operation was accompanied by the usual advice that it does not necessarily mean any change in the amounts distributed by way of dividend. The new shares stand equally with the old in all respects, including the final dividend for 1953. Last year's payment was declared in February; it made a total of 25 per cent (an increase of 5 per cent) for the year, and was covered nearly four times by the net earnings of the group. On the basis of half that rate on the doubled capital, the yield on the new shares works out at 5¼ per cent.

Cable Conditions

Annual results of the majority of the cable manufacturing companies will be due within a month or two. Meanwhile the chairman's address at last week's meeting of the General Cable Manufacturing Co., which ended its financial year in September, provides a guide to the industry's experience during the greater part of 1953, and to the further prospect. Net trading profits of General Cables were some 20 per cent under those of 1952 (although smaller tax liabilities left the net surplus with little change). For the reduction, the responsibility is debited largely to the deferment of orders for cable in anticipation of a fall in copper prices on the resumption of free dealings in the metal last August. An appreciable recovery in turnover is reported during recent months, but improvement is restrained, in the chairman's view, by a general belief that the present price of copper is still too high. Delay on the Government's part in declaring its final conclusions on the Monopolies Commission's report is aggravating present uncertainties.

General Cables

The General Cable Company's 30 per cent dividend for 1952–53 was the seventh successive distribution at that rate (or its equivalent) and was covered by earnings representing a little over 50 per cent on the Ordinary capital. The nominal amount of £150,000 of

in Electrical Investments

Company or Board	Nom. Value	Middle price 4th Jan.	Week's Rise or Fall	Dividend Previous	Dividend Last	Yield % £ s d	1953 Highest	1953 Lowest
Equipment and Manufacturing—continued.								
Hoover	5/-	27/-	+1/6	35	25	4 12 7	26/10	20/3
I.C.I.	£1	54/-		13	13	4 16 3	54/-	41/6
Intl. Combustion	5/-	15/-		25	15*	5 0 0	15/6	12/1
Johnson & Phillips	£1	50/-	+/-	15	15	6 0 0	59/3	49/-
Lancashire Dynamo	£1	43/9		12½	12½	5 14 3	47/-	41/-
Laurence, Scott	5/-	13/9		15	15	5 9 0	14/6	11/9
Lister, R. A.	£1	32/-	+6d	9	9	5 12 6	34/3	27/9
London Elec. Wire	£1	38/6	+6d	12½	15	3 18 0	38/3	26/-
J. Lucas	£1	51/3		9⅛	10⅝	4 4 6	51/3	35/6
Marryat & Scott	2/-	5/3		22½	22½	8 11 6	6/3	5/1
Mather & Platt	£1	53/6		12½	15	5 12 3	53/10	41/3
Metal Industries	£1	41/3	+1/9	15	12*	5 16 9	47/9	37/9
Midland Elec. Mfg.	£1	62/6	+1/3	15	15	4 16 0	63/9	56/3
Morphy Richards	4/-	16/3		40	40	9 17 0	16/3	13/-
Murex	£1	52/6xd		15	15	5 14 3	60/9	50/6
Newman Ind.	2/-	2/6		10	10	8 0 0	2/10	2/-
Oldham & Son	1/-	2/9		35	17½*	6 7 3	2/10	2/2
Parnall (Yate)	5/-	4/9	+3d	6	6	6 6 3	4/9	2/6
Parsons, C. A.	£1	38/3		10*	12½	—	48/-	27/9
Plessey	5/-	39/-	+2/6	25	30	3 4 1	37/-	20/1
Pye Deferred	5/-	16/-	−3d	18	20	—	16/3	10/6
Revo	10/-	17/-	−6d	27½	27½	—	17/6	13/11
Reyrolle	£1	66/3	+3d	10*	12½	—	79/-	51/-
Richardsons Westgarth	5/-	9/3		12	15	8 2 3	11/1	8/6
Scottish Cable	4/-	13/3		32	20*	6 0 9	13/3	11/1
Siemens Ord.	£1	35/-		10	10	5 14 3	37/-	31/6
S. Smith (England)	4/-	12/6		12½	15	4 16 0	12/6	7/11
Southern Areas	£1	18/9	−9d	5	6	6 8 0	19/7	10/3
Strand Elec.	5/-	7/6	−3d	17½	17½	11 13 3	10/-	7/9
Sturtevant	5/-	29/-		17½†	18·1†*	—	29/9	20/10
Sun Elec.	£1	25/-		15	15	12 0 0	27/-	24/6
Switchgear & Cowans	5/-	12/6	−1/-	22½	22½	9 0 0	16/9	12/6
Taylor, T.	5/-	12/3		20	25	5 2 0*	12/3	9/6
T.C.C.	10/-	42/6		20	20*	—	42/6	31/5
T.C. & M.	£1	31/6	+6d	10	8½*	5 8 0	31/6	25/6
Telephone Mfg.	5/-	7/6	−3d	10	10	6 13 3	9/4	7/1
Thorn Elec.	5/-	13/6	−6d	12½	12½	4 12 6	14/-	7/10
Thornycroft	£1	33/3	+9d	15	15	9 0 6	54/-	29/9
Tube Investments	£1	62/6	+6d	15*	15	4 16 0	71/9	54/-
Vactric	5/-	8/9	−1/3	Nil	Nil	Nil	10/3	3/6
Veritys	5/-	5/-		7½	10	10 0 0	5/4	4/1
Wallsall Conduits	4/-	45/-	−6d	70	70*	6 4 6	47/6	43/9
Ward & Goldstone	5/-	44/6		45	45*	5 1 0	46/-	29/9
Watford	2/-	4/9		25	25	—	5/6	4/10
Westinghouse Brake	£1	61/9	−9d	14	15	4 17 3	64/-	51/3
West, Allen	5/-	12/9	−3d	15	15	5 17 9	14/4	10/3
Wolf Electric	5/-	11/-		—	15	6 16 3	12/8	9/6
Trusts, Transport and Communications								
Anglo-Am. Tel.:								
A Ord.	100	83½		—	6	7 3 9	91	77
Ord.	100	57½		—	3¾	6 10 5	57½	53
Anglo-Portuguese	£1	21/9		8	8	7 7 3	23/9	20/1
Brit. Elec. Traction:								
Def. Ord.	5/-	39/6	+2/-	25	35	4 8 6	39/6	21/3
Cable & Wireless:								
Ord.	100	146	−2	8	8	5 9 6	148	124
4½ Loan	100	96½		4	4	4 3 0	97⅜	93
Calcutta Trams	£1	19/9		6†	2½†	—	23/6	16/-
Cape Elec. Trams	£1	13/-		5½	5½	8 9 3	13/-	9/-
Marconi Marine	£1	28/9		10	10	6 19 2	31/6	26/9
Oriental Tel. Ord.	£1	75/-		16	16	—	75/-	59/-
Telephone Props.	£1	4½		8	8	—	126/3	33/-
Telephone Rentals	5/-	9/3xd		10	10*	—	10/-	6/8

the latter, together with £75,000 in preference stock, compares with net assets totalling, in the last balance-sheet, more than half a million. A controlling interest in the company is held by F. McNeil & Co. and there is a somewhat limited market in the 5s ordinary shares. They changed hands recently at 16s 3d, on which basis the yield works out at nearly 9¼ per cent. In his report the chairman of the company is confident that in the long run the growing importance of cable manufacturing in modern times will restore stable conditions in the industry.

Brazilian Traction

Last month brought a double disappointment to shareholders in the Brazilian Traction Power & Light Company. They heard in the first place of the board's decision to reduce the dividend for the year from 50 cents to 3 cents, plus a small stock distribution. Subsequently came the reports of President Vargas' intention either to establish a national electric power industry or to take over private firms which are not giving the desired results. The precise meaning of the reports is not clear, and no individual firms were named. The general inference was enough, however, to reduce the price of Brazilian Traction shares initially to $12½. They stood at over $20 earlier in the year. The price was steadied at around $13¼ later by a reassuring statement from the company.

REPORTS and DIVIDENDS

The General Cable Manufacturing Co., Ltd.—Speaking at the annual meeting held on 31st December, Mr. C. W. R. Pantlin (chairman), said that the reduction in profit for the year under review was due to exceptionally difficult trading conditions encountered during the second half of the year, and which arose through circumstances beyond their control. The full impact was partially offset by the steady progress which had been made in extending the scope of their business in the industrial and specialized fields. Additional plant had placed them in a better position to benefit from a return to more normal conditions in the trade. It would, however, be unrealistic to look for an improvement in the immediate future as, although an appreciable recovery had been made in turnover since the end of the financial year, the general belief that the present price of copper was still too high continued to exercise a restraining influence on trade.

Uncertainty as to the outcome of the Monopolies Commission's report also continued to overshadow the whole industry.

The Jerusalem Electric & Public Service Corporation, Ltd., held its annual meeting on 31st December, when Mr. H. G. Balfour (chairman), who presided, said that the greatly increased costs of operation, which were largely outside the control of the Corporation, combined with inadequate tariffs, resulted in a deficit on the year's working in the Israel area of I£73,841. Representations had been made to the Israel Government in regard to this unsatisfactory position. A temporary bulk supply from another source, arranged with the assistance of the Israel Government, which became available as from 24th December, 1952, had increased to 4,500 kW by the end of the year under review. This supply was now being replaced by a larger bulk supply of up to 15,000 kW afforded by means of a 110/66 kV h.v. transmission line connected with the system of the Palestine Electric Corporation. In the Jordan area of supply the sales of electricity in the year to 31st March, 1953, increased from 1,065,192 to 1,399,353 kWh. No finality had yet been reached with the Palestine Electric Corporation in the discussions with a view to some form of amalgamation of interests, while the problems involved in the plans for segregation of the Jordan assets and the possibility of the formation of a new company to administer the Jordan area were still under consideration.

Turner & Newall, Ltd.—In the course of his statement reviewing the activities of the group during the past year, Mr. W. W. F. Shepherd (chairman), says that the total volume of their export business has been well maintained. Conditions continue to be difficult as a result of import restrictions and exchange difficulties in various markets. Nevertheless, the development in other markets has been sufficient almost to offset those which are closed. So far during the current year there has been some recrudescence of demand which, if maintained throughout the year, would lead to the expectation of improved results from their home companies, while the volume currently available to their overseas companies is tending to contract. The board therefore expects that the results of the current year's trading will not be markedly different from those of the year under review.

W. R. Sykes Interlocking Signal Co., Ltd. (controlled by the Westinghouse Brake & Signal Co., Ltd.), reports trading profits and sundry income for the year to 26th September last of £37,743, as compared with £36,318 for the preceding year. After meeting all charges, including £24,400 for taxation, there is a net profit of £11,600 (against £12,783). The dividend on the 6 per cent preference is paid, general reserve receives £8,003, and £28,474 is carried forward (against £16,387 brought in).

Bennis Combustion, Ltd., has declared an interim dividend of 5 per cent (unchanged).

New Companies

Transistor Development Co., Ltd.—Registered 7th December. Manufacturers of and dealers in germanium diodes, transistors and like devices and electronic and electronic mechanical devices, etc. The first directors are not named. Regd. office: Montagu House, Sussex Street, Cambridge.

William Graham (Television), Ltd.—Registered 7th December. Capital £100. To construct and maintain wireless signal and other stations, and to carry on the business of renters of radio and or television apparatus, etc. Directors: W. Graham and Sarah Graham. Regd. office: 31, Hill Street, Brierfield, Lancs.

E. Harvey (1953), Ltd.—Registered 10th December. Capital £5,000. To acquire the business of an electrical, mechanical and diesel engineer carried on by E. Harvey at 116 8, St. Helens Street and 1, Regent Street, Ipswich. E. G. F. Harvey is the first director. Regd. office: 116, St. Helens Street, Ipswich, Suffolk.

Hudson & Carter, Ltd.—Private company. Registered 22nd December. Capital, £2,000. Electrical engineers and contractors, manufacturers of and dealers in wireless apparatus, etc. Directors: H. Hudson and A. W. Carter. Regd. office: Central Chambers, High Street, Long Eaton, nr. Nottingham.

Bertford Manufacturing & Supply Co., Ltd.—Registered 1st December. Capital £5.000. To acquire the business of electrical factors and merchants heretofore carried on by H. L. Aspinall and A. R. Aspinall, trading as Bertford Manufacturing & Supply Co., at Marklands Works, Horwich. Directors: H. L. Aspinall and A. R. Aspinall. Regd. office: Marklands Works, Horwich, Lancs.

Liquidation

Electronic Services (Westerham), Ltd.—Creditors' voluntary liquidation. Particulars of claims by 21st January to the liquidator, Mr. F. Goodman, 3, Broad Street Buildings, Liverpool Street, London, E.C.2.

Bankruptcies

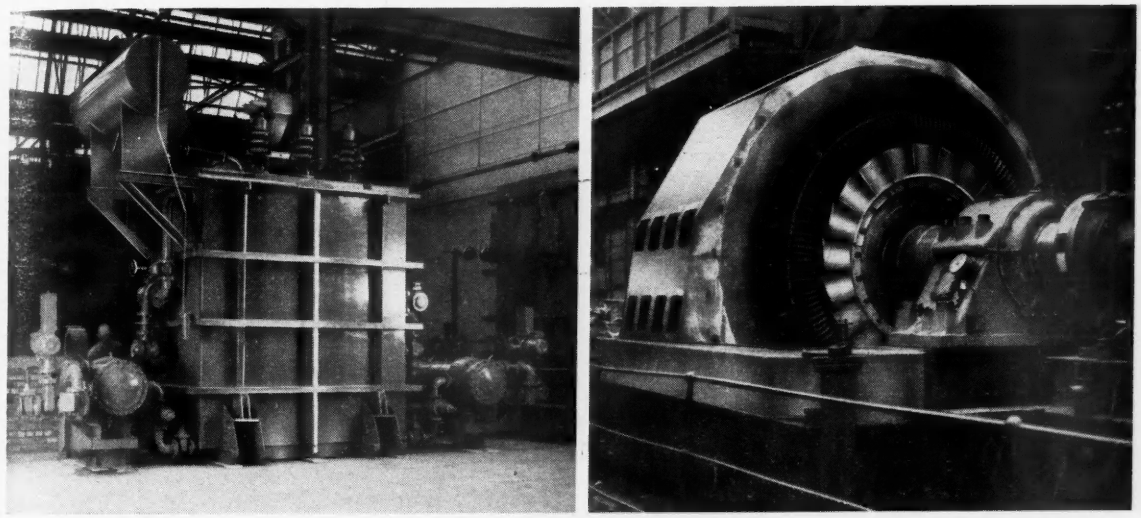
M. Tilley, 13, Shakespeare Street, Newcastle-on-Tyne, electrical and radio wholesaler, trading as Hawkins Tilley & Co.—First and final dividend of 2s 1¼d in the £, payable on and after 15th January at the Official Receiver's Office, Clarendon House, Clayton Street West, Newcastle-on-Tyne.

A. J. Coles, 424, Pinner Road, Harrow, Middx., lately carrying on business at 2a, Pinner Road, Harrow, electrical engineer and contractor.—First and final dividend of 7s 2d in the £, payable from 8th January at the Official Receiver's Office, 58–61, York Terrace, Regent's Park, London, N.W.1.

N. Lusher, formerly of 15, Cheltenham Parade and 11A, Dragon Parade, Harrogate, who now has premises at the back of 18b, Oxford Street, Harrogate, electrician —Receiving order made 21st December on a creditor's petition.

Electrical Manufacturing–1953

Activities of Bruce Peebles & Co., Ltd.



One of four 16·7 MVA Bruce Peebles water-cooled generator transformers for the Owen Falls hydro-electric scheme, Uganda, and (right) a 14 MVA hydro-electric generator for Norway

AT the works of Bruce Peebles & Co., Ltd., in 1953, busy conditions prevailed in all departments. The export trade has presented a more complex problem than formerly and while the intake of new orders has been substantial, it is evident that foreign competition is becoming increasingly severe.

Hydro-electric schemes continue to play an important part in the company's activities. Large plant commissioned overseas, or now on order, includes numbers in sizes up to 16,000 h.p. for various schemes in Norway, South Africa, Malaya, and New Zealand. Other large rotating plant on order for export includes three 16,380 kVA synchronous condensers for Australia, a 10,000 kVA unit for New Zealand, a 2,000 h.p. motor-generator for India, and steam-driven alternators up to 3,500 h.p. for the West Indies and Sierra Leone. Numbers of a.c. motors in sizes up to 2,000 h.p. have been ordered for Australia, Canada, South Africa, and the Gold Coast. The demand for flameproof motors for oil refineries has remained steady throughout the year and large numbers have been ordered for Australia, Indonesia, Venezuela, Borneo, and other parts of the world.

Large rotating machines for the home market include several hydro-electric generators in sizes up to 30,000 h.p. for the Scottish Highlands, and motors up to 8,000 h.p. for industrial use in various parts of the country. Big deliveries of motors covering a wide range of sizes for industrial use have been made during the year, and many orders have been placed for flameproof and other motors by concerns ranging from coal mines to gas works and flour mills. The growing demand for big squirrel cage motors for direct-on-line starting is illustrated by the many orders received for motors up to 2,000 b.h.p. for individual drives in factories, collieries and power stations. A further order has been received for two 1,500 kW frequency boosters for giving an electricity supply to 1,150 ton walking draglines for use in open-cast mining.

The activities of the transformer department have been on a level with past peak years, and deliveries include units from a few kVA up to the largest sizes for voltages up to 132 kV. Examples are another two 16,670 kVA generator transformers for the Owen Falls hydro-electric scheme, Uganda; six 4,575 kVA rectifier transformers for the South African Railways; and numbers of distribution transformers in sizes up to 3,000 kVA for various electricity supply authorities in Canada.

Transformers completed for the North of Scotland Hydro-Electric Board totalled 212 MVA in sizes between 10 MVA and 30 MVA and there were also many pole mounting and distribution transformers from 4·8 kVA up to 2 MVA. For the B.E.A. the transformers despatched aggregated nearly 180 MVA in sizes from 5 MVA to 30 MVA. Over 15 MVA of transformers went to the N.C.B., and many 1·5 MVA air-cooled units were completed for a Government establishment.

Large capacity transformers in various stages of manufacture include two 120 MVA 275 kV units for the supergrid, two 72 MVA and a 37·5 MVA generator transformers for B.E.A. power stations, and other sizes up to 45 MVA for the 132 kV grid, in addition to many distribution transformers. Substantial additional orders for transformers in sizes up to 30 MVA are in hand for the North of Scotland Hydro-Electric Board and the Area Boards. Interesting new orders have come from the N.C.B. for a wide range of mining type transformers.

In the field of rectification work is nearing completion on the contract for the manufacture, supply and erection of nineteen 2·5 MV 1,500 V d.c. steel cylinder rectifier substation equipments with a total capacity of 47·5 MW for the Manchester–Sheffield–Wath railway electrification scheme. Outstanding among glass bulb rectifiers completed during the year was a 1·5 MW unit for the N.C.B. Orders have also been received for many battery charging rectifiers for mines, and industrial glass bulb rectifiers.

NEXT WEEK'S EVENTS

Organizers of electrical functions are advised to make use of the "Electrical Review" clearing house, Room 231, Dorset House, Stamford Street, London, S.E.1, to ascertain that proposed dates for their functions do not clash with others already arranged

Monday, 11th January

BIRMINGHAM.—Imperial Hotel, 6 p.m. I.E.E. South Midland Supply and Utilization Group. "An Assessment of the Impregnated Pressure Cable," by Dr. L. G. Brazier, D. T. Hollingsworth and Dr. A. L. Williams.

BRADFORD.—Technical College, 7.15 p.m. Bradford Engineering Society. "Instruments for Promoting Efficiency in the Boilerhouse," by J. Tham.

BRISTOL. — Electricity House, Colston Avenue, 6 p.m. I.E.E. Western Centre. "Design Features of Certain British Power Stations," by S. D. Whetman and A. E. Powell.

DUNDEE.—Mathers Hotel, 7.30 p.m. Incorporated Plant Engineers, Dundee Branch. "Maintenance of Electric Motors," by A. D. Christie.

LEICESTER. — Electricity Offices, Charles Street, 7 p.m. Leicester Electrical Society. "Electrically Equipped Machine Tools," by W. L. Sims.

LONDON.—Savoy Place, W.C.2, 7 p.m. I.E.E. London Students' Section. Film evening.

St. Ermin's Hotel, Caxton Street, 7 p.m. A.S.E.E. Central London Branch. "Switchgear," by K. N. Swash.

MANCHESTER.—Engineers' Club, Albert Square, 7.30 p.m. Junior Institution of Engineers, North Western Section. Chairman's Address; part I, "The Junior Associations"; part II, "The Training of Supervisory Staff and Foremen," by A. R. Bateman.

NEWCASTLE-ON-TYNE.—Neville Hall, Westgate Road, 6.15 p.m. I.E.E. North Eastern Centre. "The Technique and Development of Automatic Winding in Mine Shafts," by B. L. Metcalf and G. Cuttle.

King's College, 6.30 p.m. Institute of Fuel, North Eastern Section. "The Calorific Value of Coal," by J. Brown.

SHEFFIELD.—The University, Western Bank, 6.30 p.m. I.E.S. Sheffield Centre. "Lighting of Churches," by L. C. Rettig.

Livesey Clegg House, 7.30 p.m. Junior Institution of Engineers, Sheffield and District Section. "Clean City Air—An Engineer's Problem," by J. Law.

Tuesday, 12th January

BELFAST.—Presbyterian Hostel, 6.15 p.m. I.E.E. Northern Ireland Centre. "Fluorescent Discharge-Tube Circuits and Operating Problems," by J. Cates.

BIRMINGHAM.—The Union, Birmingham University, Edgbaston, 6 p.m. I.E.S. Birmingham Centre. "Applied Lighting," by E. H. Norgrove. (Joint meeting with University of Birmingham Engineering Society.)

Grand Hotel, 7 p.m. Institution of Works Managers, Birmingham Branch. "Brains Trust."

KENTON.—Rest Hotel, 8.15 p.m. A.S.E.E. North West London Branch. "Industrial Lighting."

LEEDS.—1, Whitehall Road, 6.30 p.m. I.E.E. North Midland Students' Section. Main Centre Chairman's Address, by G. Caton.

LIVERPOOL.—Adelphi Hotel, 6.30 p.m. Institution of Works Managers, Merseyside Branch. "Personality," by J. Farrell.

LONDON.—2, Savoy Hill, W.C.2, 6 p.m. Illuminating Engineering Society. "Studies in Interior Lighting," by J. M. Waldram.

MANCHESTER.—Engineers' Club, Albert Square, 6.15 p.m. I.E.E. North-Western Supply Group. "Transformer-Analogue Network Analysers," by M. W. Humphrey Davies and Dr. G. R. Slemon.

Engineers' Club, Albert Square, 7.15 p.m. Incorporated Plant Engineers, Manchester Branch. "Fan Engineering," by C. Gordon Huntley.

NEWPORT.—Tredegar Arms Hotel, 7 p.m. Newport and District Electric Club. "Salvaging of Ships," by Comm. R. Walker (with film).

PRESTON.—Starkie House, Starkie Street, 7.30 p.m. Institution of Works Managers, Preston Branch. Discussion on "Adapting a Labour Force to a Changed Production Programme," led by H. Markus.

RUGBY.—College of Technology and Arts, 6.30 p.m. I.E.E. Rugby Sub-Centre. "Some Mechanisms of Insulation Failure," by H. F. Church and C. G. Garton. "Insulation of Rotating Electrical Machinery," by E. Jones.

Wednesday, 13th January

ABERDEEN.—Caledonian Hotel, 7.30 p.m. I.E.E. North Scotland Sub-Centre. "Street Lighting," by T. L. Lappin.

BIRMINGHAM. — James Watt Institute, 6.45 p.m. I.E.E. South Midland Students' Section. "An Outline of Television Systems," by Dr. R. L. Smith-Rose.

BLACKBURN.—N.W.E.B., Darwen Street, 7.15 p.m. I.E.E. North Lancashire Sub-Centre. "The History of Television," by G. R. M. Garratt and A. H. Mumford.

BRADFORD.—Midland Hotel, 7.30 p.m. A.S.E.E. Bradford Branch. "Navigation," by J. Whiteley.

FARNBOROUGH.—R.A.E. Technical College, 7.30 p.m. I.E.E. Southern Centre. "Electronic Speed Control of Motors," by J. C. Rankin.

HUDDERSFIELD.—Y.E.B., Market Street, 7.30 p.m. I.E.S. Huddersfield Group. "Television," by C. Buckle.

LONDON.—Savoy Place, W.C.2, 5.30 p.m. I.E.E. Radio Section. "A Single-Sideband Controlled-Carrier System for Aircraft Communication," by G. W. Barnes.

NEWCASTLE-UPON-TYNE. — Neville Hall, Westgate Road, 6 p.m. British Institution of Radio Engineers, North Eastern Section. Short Papers by Students.

NOTTINGHAM.—Gas Board Showrooms, Parliament Street, 7 p.m. Incorporated Plant Engineers, East Midlands. "Gas and Oil Engines," by A. C. Yeates.

YORK.—City Hotel, Lendal, 7.30 p.m. A.S.E.E. York Branch. "Estimating," by T. Howell.

Thursday, 14th January

CHATHAM.—Sun Hotel, 7.15 p.m. Institute of Welding, Medway Section. Discussion on "Jigs and Fixtures for Welding." (Joint meeting with the Institution of Production Engineers.)

DUNDEE.—Royal Hotel, 7 p.m. I.E.E. North Scotland Sub-Centre. "Street Lighting," by T. L. Lappin.

HULL.—Y.E.B., Ferensway, 7.15 p.m. I.E.E. North Midland Centre, district meeting. "Inherent Current, Voltage and Speed Control in Dynamo-Electric Machinery," by J. C. Macfarlane, Dr. J. W. Macfarlane and W. J. Macfarlane.

LIVERPOOL.—Electricity Showroom, Whitechapel, 7 p.m. E.P.E.A. Merseyside Technical Group. "Formation and Application of Tariffs," by W. Gilchrist.

LONDON.—Manson House, Portland Place, W.1, 6 p.m. Society of Instrument Technology, Control Section. Annual general meeting followed by "The Theory and Design of Compound Action Automatic Controllers with particular reference to the Interaction Factor," by H. Williamson.

MALVERN.—Winter Gardens Restaurant. 7.15 p.m. I.E.E. South Midland Centre, "Transmission of Pictures by Radio," by A. W. Cole.

NEWCASTLE-UPON-TYNE. — Carliol House, 3 p.m. E.I.B.A. Northern Counties Area. Annual general meeting.

SALFORD.—10, Blackfriars Street, 6 p.m. I.E.S. Manchester Centre. "Lighting for Textile Production," by H. Hewitt. (Joint meeting with the Textile Institute.)

SHEFFIELD. — Grand Hotel, 7.30 p.m. Institution of Works Managers, Sheffield Branch. "What makes a Good Foreman," by J. R. Edwards.

SWANSEA.—Central Public Library, Alexandra Road, 6 p.m. I.E.E. West Wales (Swansea) Sub-Centre. "Voltage Transformers and Current Transformers associated with Switchgear," by W. Gray and A. Wright.

Friday, 15th January

BIRMINGHAM.—Imperial Hotel, 7.30 p.m. Incorporated Plant Engineers, Birmingham Branch. Contractors' Plant Discussion Group.

EDINBURGH.—Grosvenor Hotel. I.E.S. Edinburgh Centre. Annual dinner and dance.

LONDON.—Storey's Gate, St. James's Park, S.W.1, 5.30 p.m. Institution of Mechanical Engineers. Thomas Lowe Gray Lecture: "High Temperature Steam and Gas Turbine Machinery for Marine Propulsion," by Dr. T. W. F. Brown.

NEWCASTLE-UPON-TYNE.—Mining Institute, 6.15 p.m. North East Coast Institution of Engineers and Shipbuilders. "Metallurgical Aspects of High Temperature Steam and Gas Turbine Plants," by Dr. J. M. Robertson.

Saturday, 16th January

SOUTH ELMSALL.—I.E.E. North Midland Students' Section. Visit to N.C.B. South Elmsall Colliery.

Venezuelan Programme

ALTHOUGH electricity output in Venezuela has increased at the rate of 20 per cent in recent years the total annual production (722·3 million kWh in 1952) is still only equal to 123 kWh per head of the population. In 1950 an expansion programme was begun the first phase of which is scheduled for completion next year, when it is anticipated that the demand will amount to 930 million kWh. During 1952–53 the Venezuelan Development Corporation set aside 44·9 million bolívares (£4·7 million) to increase generating plant capacity. Most of the individual projects are small. The principal schemes include the doubling of the 15,000 kW La Cabrera plant near Maracay; construction of a 6,000 kW plant to supply Tariba, Cordero, El Cobre and Pregonero; a new 5,000 kW plant at Caucagua, with new lines between Ocumare, Cua and Charallave; and electrification of the Turén farming centre, Portuguesa, together with the neighbouring towns of Píritu, Villa Bruzual and Santa Rosalía.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (2s 8d each including postage) will be obtainable after 17th February from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1950

127. Standard Telephones & Cables, Ltd. —Electro-acoustic transducers. 29th December, 1950. (704065.)

7501. Commissariat à l'Energie Atomique. —Electron beam tubes. 24th March, 1950. (704323.)

11195. Mellor, Bromley & Co., Ltd.—Electrical stop motions for knitting machines. 19th March, 1951. (703986.)

14224. Edison Swan Electric Co., Ltd., and Keen, P. E. R.—Lighting fittings. 6th June, 1951. (704068.)

16087. Electric & Musical Industries, Ltd.—Television relay apparatus. 14th June, 1951. (704141.)

19302. Brown, W. J.—Electrical control systems. 31st August, 1951. (704071.)

19580. Marconi's Wireless Telegraph Co., Ltd.—Television receivers. 4th July, 1951. (704146.)

20005. Calor-Emag Elektrizitäts Akt.-Ges. —Methods of arc extinguishing in switches by means of an extinguishing stream controlled by switch movements and apparatus for carrying out such methods. 11th August, 1950. (704147.)

20012. English Electric Co., Ltd.—Fans. 19th October, 1951. (704240.)

21363. British Insulated Callender's Cables, Ltd.—Production of cable sheaths and other tubular metallic bodies. 28th November, 1951. (703988.)

22872. Brown, W. J.—Control systems for electric motors. 18th October, 1951. (703990.)

23219. British Broadcasting Corporation.— Optical systems for galvanometers and the like. 21st September, 1951. (704150.)

26700. Postmaster General. — Facsimile telegraph apparatus. 16th November, 1951. (704152.)

26781. Akt.-Ges. Brown, Boveri & Cie.— Magnetic induction accelerator in which the acceleration and the guiding flux is produced by an excitation winding arranged coaxially with the annular tube. 2nd November, 1950. (704339.)

27045. Research Corporation.—Electrical precipitation apparatus. 6th November, 1950. (704340.) 27046.—Recovery of material from roaster gases by electrostatic precipitation. 6th November, 1950. (703993.)

27344. Standard Telephones & Cables, Ltd.—Processes for depositing selenium on to metallic plates. 8th November, 1950. (704154.)

28188. Metropolitan-Vickers Electrical Co., Ltd.—High-frequency resonators. 17th November, 1950. (703995.)

29985. Pye, Ltd.—Reverse gearing drive unit. 4th March, 1952. (704081.)

30224. Gilfillan Bros., Inc.—Antenna system of an object locating system. 11th December, 1950. (704341.)

30960. G.W.B. Electric Furances, Ltd.— Furnace conveyor. 27th July, 1951. (704250.)

31003. Philips Electrical Industries, Ltd.— Methods of breaking metal tubing or rods. 20th December, 1950. (704155.)

1951

501. Bailey Meters & Controls, Ltd.— Magnetic motion controlling apparatus. 8th January, 1951. (704084.)

1421. Sommerhoff, G. W. C.—Electric remote control. 7th February, 1952. Cognate applications 1991, 26th January, 1951, and 7611, 2nd April, 1951. (704252.)

1539. Siemens Bros. & Co., Ltd.—Manufacture of electric cables. 18th January, 1952. (703999.)

1657. Armco International Corporation.— Production of electrical steel strip. 22nd January, 1951. (704159.)

3505. Metropolitan-Vickers Electrical Co., Ltd.—Electrical pulse generating apparatus. 12th October, 1951. (704345.)

3760. Scott, W. F.—Means for the refacing of electrical contacts. 18th February, 1952. (704003.)

4258. Sperry Corporation.—Electron-discharge tubes employing travelling waves. 21st February, 1951. (704347.)

5645. McCarthy, P. M.—Fused electric plugs. 9th June, 1952. (704255.)

5755. Metropolitan-Vickers Electrical Co., Ltd.—Precision casting by lost-wax process. 7th December, 1951. (704004.)

6241. Allmanna Svenska Elektriska Aktiebolaget.—Transductors with self-excitation. 15th March, 1951. (704349.)

6488. Record Electrical Co., Ltd., Campaigne, J., and Abbink-Spaink, P. F.—Electrical apparatus for indicating whether or not the speed of a rotary member is above a predetermined minimum. 4th April, 1952. (704088.)

6584. Marconi's Wireless Telegraph Co., Ltd.—Luminescent indicators of voltage. 13th February, 1952. (704166.)

7416. Standard Telephones & Cables, Ltd.—Joints in electric cables. 28th March, 1952. (704352.)

8277. Sperry Products, Inc.—System for transmission of ultrasonic waves. 10th April, 1951. (704354.)

9908. Westinghouse Electric International Co.—Resinous compositions, particularly for insulating purposes. 27th April, 1951. (704008.)

10003. British Klockner Switchgear, Ltd. —Automatically operating electrical shunts. 13th April, 1952. (704170.)

11486. Raibourn, P.—Ionic crystal relay system. 16th May, 1951. (704264.)

12807. Electric & Musical Industries, Ltd. —Magnetic sound recording and reproducing apparatus. 28th May, 1952. (704175.)

13568. Thorn Electrical Industries, Ltd.— Starting switches and supply circuits for electric-discharge tubes. 3rd June, 1952. (704176.)

13635. Smith & Sons (England), Ltd., S.— Starting devices for electrically operated clocks. 23rd May, 1952. (704177.)

14134. Metropolitan-Vickers Electrical Co., Ltd.—Frequency discriminator circuits for frequency modulated waves. 14th June, 1951. (704178.)

15070. British Insulated Callender's Cables, Ltd.—Protective coverings for electric cables, pipes and the like. 24th June, 1952. (704096.)

15147. British Thomson-Houston Co., Ltd.—Electric incandescent lamps. 26th June, 1951. (704266.)

15276. Marconi's Wireless Telegraph Co., Ltd.—Aerial systems. 21st April, 1952. (704015.)

15374. British Thomson-Houston Co., Ltd. —Electric incandescent lamps. 28th June, 1951. (704181.)

15417. Sylvania Electric Products, Inc.— Supporting latch for lighting fixtures. 28th June, 1951. (704016.)

15562. Watson Saville & Co., Ltd.— Manufacture of permanent magnets. 4th April, 1952. (704018.)

18250. British Dielectric Research, Ltd.— Manufacture of dielectric material. 31st July, 1952. (704182.)

19207. Udylite Corporation.—Electroplating of nickel. 15th August, 1951. (704185.)

19471. Siemens-Reiniger-Werke Akt.-Ges. —Electric-discharge tubes. 17th August, 1951. (704362.)

20076. Crabtree & Co., Ltd., J. A., Morgan, R. W., and Coleman, E.—Shielded electric sockets. 7th July, 1952. (704100.) 20077. Contacts and terminals for electric sockets. 7th July, 1952. (704102.)

20825. English Electric Co., Ltd.—Gas turbines. 29th August, 1952. (704274.)

21147. Blaupunkt-Werke Akt.-Ges. — Method and apparatus for treatment of objects with ultra short waves. 7th September, 1951. (704364.)

21678. Lumalampan Aktiebolag.—Device for the production of a light-diffusing coating on surfaces. 14th September, 1951. (704189.)

22159. Record Electrical Co., Ltd., and Lomax, S.—Slip indicators. 19th September, 1952. (704191.)

22396. Philips Electrical Industries, Ltd.— Carrier-wave multiplex telephone systems. 25th September, 1951. (704275.)

23262. Licentia Patent-Verwaltungs-Ges.— Electric transformers with pressure resisting casing. 5th October, 1951. (704277.)

23619. Standard Coil Products Co., Inc.— Printed circuits. 10th October, 1951. (704365.)

23802. Electrolux, Ltd. — Refrigerators cooled by means of absorption refrigerating apparatus. 12th October, 1951. (704196.)

23869. General Electric Co., Ltd., Breadner, R. L., and Simms, C. H.—Methods of sealing crystalline windows in glass walls, especially envelopes of electric discharge devices. 13th October, 1952. (704118.)

23934. Universal Injection Plastics, Ltd., and Johnston, J.—Fittings for lamp shades. 30th September, 1952. (704197.)

24128. General Electric Co., Ltd., and Leeds, R. E.—Methods of drawing wire through dies. 26th September, 1952. (704278.)

24467. General Electric Co., Ltd., and Ley, D. A.—Multi-channel electrical communication systems. 1st December, 1952. (704280.)

24704. Philips Electrical Industries, Ltd.— Electric pulse generators. 23rd October, 1951. (704281.)

25135. Siemens & Halske Akt.-Ges.— Telephone installations. 26th October, 1951. (704036.)

25869. General Electric Co., Ltd., Scowcroft, J., and Chubb, A. A.—Automatic telephone systems. 26th September, 1952. (704039.)

27085. British Thomson-Houston Co., Ltd. —Drive mechanism for washing machines. 19th November, 1951. (704283.)

27308. Beckman Instruments, Inc.—Glass electrode. 21st November, 1951. (704040.)

27549. Metropolitan-Vickers Electrical Co., Ltd.—Systems and apparatus for the formation of images by total reflection of incident radiation. 23rd November, 1951. (704285.)

27936. Radio Corporation of America.— Synchronizing signal separator. 28th November, 1951. (704287.)

28541. Simpson, R.—Safety device for use with electrical appliances. 5th December, 1951. (704204.)

28604. Fielden (Electronics), Ltd.—Humidity measuring devices. 17th October, 1952. (704205.)

29598. Western Electric Co., Inc.—Telephone switching systems employing gas discharge tubes. 18th December, 1951. (704108.)

29951. Philips Electrical Industries, Ltd.—Discharge tubes for generating, amplifying, or modulating millimetre waves. 21st December, 1951. (704378.)

1952

1138. Licentia Patent-Verwaltungs-Ges.—Electric transformer with pressure resisting casing for mines and the like. 15th January, 1952. Addition to 704277. (704291.)

3146. British Thomson-Houston Co., Ltd.—Control systems for electric motors. 6th February, 1952. (704295.)

4045. Crabtree & Co., Ltd., J. A., Morgan, R. W., and Coleman, E.—Shielded electric sockets. 22nd December, 1952. (704297.)

5761. Philips Electrical Industries, Ltd.—Radio transmission systems for stereophonic signals and transmitters and receivers for use therein. 5th March, 1952. (704221.)

5914. Motor Products Corporation.—Refrigerators. 6th March, 1952. (704223.)

7205. Babcock & Wilcox, Ltd.—Centrifugal classifiers. 20th March, 1952. (704132.)

8820. Philips Electrical Industries, Ltd.—Circuit arrangements for use in automatic signalling systems. 7th April, 1952. (704228.)

9443. Automatic Electric Laboratories, Inc. — Winding control mechanism. 15th April, 1952. (704229.)

10458. Standard Telephones & Cables, Ltd.—Radio frequency transmission system. 25th April, 1952. (704050.)

10880. British Thomson-Houston Co., Ltd.—Food mixers. 30th April, 1952. (704305.)

11973. Ancel, G.—Automatic electrical phonographs. 12th May, 1952. (704308.)

16791. Hammond, J. H.—Television system. 3rd July, 1952. (704313.)

19539. General Electric Co.—Freezing trays. 1st August, 1952. (704314.)

20699. Research Corporation. — Electrostatic precipitators. 18th August, 1952. (704054.)

27349. General Electric Co., Ltd., Bowman, D. F., and Ward, P. W.—Electric pulse lengthening apparatus. 30th October, 1952. (704318.)

30655. Standard Telephones & Cables, Ltd.—Electromagnetic vibratory devices. 29th December, 1950. Divided out of 704065. (704140.)

32229. Babcock & Wilcox, Ltd.—Combustion apparatus. 19th December, 1952. (704320.)

Amended Specifications

632862. Berridge & Co., Ltd., I. L., & others.—Snap action switches and other snap action mechanisms.

660591. Philips Electrical, Ltd., & others.—Anisotropic permanent magnets and alloys therefor.

665493. Stevens, A. H. (Thomas & Betts Co.).—Electrical cable connecting assemblies.

673820. Pye, Ltd., & another.—Mounting arrangement for television pick-up tubes.

682716. Allmanna Svenska Elektriska Aktiebolaget.—Means for controlling the candlepower of luminous electric discharge tubes.

691128. Minister of Supply.—Waveguide devices.

TRADE MARKS

APPLICATIONS have been made for the registration of the following trade marks. Objections may be entered up to 23rd January:—

SINEPERT. No. 718,300, Class 9. Electrical apparatus and instruments and parts thereof, all included in Class 9; and insulated electric wire, electric fuse wire and electric cables.—Steatit-Magnesia Aktiengesellschaft, Lauf-Pegnitz, Germany. Address for service, c/o Gill, Jennings & Every, 51-52, Chancery Lane, London, W.C.2.

SIEGFRIED (design). No. B719,465, Class 9. Wireless sets, television sets, gramophones and talking machines.—Mohamed Husain Ismail, 60, Newman Street, London, W.1.

GECALLOY. No. 720,666, Class 9. Magnets and magnetic cores, all made from metal alloys or powders thereof.—General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2.

REVCON. No. 720,893, Class 9. Electric apparatus for use in controlling the speed of hoist and winch drives and the like lifting apparatus by means of current control.—Laurence, Scott & Electromotors, Ltd., Gothic Works, Hardy Road, Norwich.

CHROMICON. No. 723,678, Class 9. Television apparatus and parts thereof included in Class 9; and cathode ray tubes.—Cathodeon, Ltd., Radio Works, St. Andrews Road, Cambridge.

ESTRASIL. No. 723,702, Class 9. Scientific and electrical apparatus and instruments all included in Class 9; and wireless apparatus and instruments.—B.C. Electrical Techniques, Ltd., 17, Pemberton Road, Harringay, London, N.4.

East African Imports

ELECTRICAL imports into East Africa in 1952 increased by about one-third in value on the previous year. Kenya accounted for about three-fifths of the total, with Tanganyika next and Uganda rather less important. The expansion of imports of power plant was noteworthy, and a big programme of extension and installation has since been proceeding. The radio trade also was active. Another feature was the competition in wires and cables from no fewer than six supplying countries. The accompanying table shows the relative importance of the three territories as purchasers of electrical equipment.

Class of Equipment	KENYA		UGANDA		TANGANYIKA	
	1952 £ (000)	Inc. or dec. on 1951 £ (000)	1952 £ (000)	Inc. or dec. on 1951 £ (000)	1952 £ (000)	Inc. or dec. on 1951 £ (000)
Generators, motors, convertors and transformers	572	+ 302	265	+ 33	219	+ 102
From U.K.	526	+ 312	262	+ 137	195	+ 97
„ *U.S.A.*	38	+ 12	1	—	8	− 5
Batteries and accumulators for motor vehicles	107	− 23	36	− 23	89	+ 23
From U.K.	85	− 36	30	− 25	88	+ 23
„ *South Africa*	2	+ 1	—	—	—	− 1
„ *U.S.A.*	1	+ 1	—	—	—	—
Lamp and torch batteries	38	− 7	8	− 15	23	− 6
From U.K.	4	+ 4	1	—	2	+ 1
„ *Malaya*	23	− 5	5	− 7	16	− 2
„ *South Africa*	9	− 7	1	− 8	3	− 7
Other batteries and accumulators	40	+ 16	5	+ 3	18	+ 9
From U.K.	18	+ 3	3	+ 2	8	+ 4
„ *Belgium (on Government account)*	11	+ 6	—	—	5	+ 5
„ *South Africa*	8	+ 5	—	—	2	− 1
Bulbs and tubes for lighting, domestic	46	+ 14	9	− 1	24	+ 6
From U.K.	30	+ 14	6	—	15	+ 5
„ *Holland*	15	—	3	—	8	+ 1
Ditto for torches and handlamps	9	+ 3	3	—	6	+ 2
From U.K.	6	+ 3	2	—	4	+ 2
Radio receiving sets, domestic	134	+ 45	65	+ 23	73	+ 19
From U.K.	64	+ 20	29	+ 8	41	+ 13
„ *Holland*	56	+ 16	32	+ 15	28	+ 6
Ditto, other, and spares	59	+ 4	30	+ 24	24	+ 6
From U.K.	50	+ 4	27	+ 22	22	+ 6
„ *Holland*	3	− 1	1	—	2	+ 1
Telegraph & telephone instruments and apparatus	211*	− 201	6*	− 21	68*	+ 13
Insulated cables and wires	966	+ 444	130	− 163	294	+ 119
From U.K.	862	+ 369	125	− 164	259	+ 109
„ *Holland*	26	+ 26	—	—	25	+ 25
„ *South Africa*	2	− 26	—	− 3	1	− 24
„ *Japan*	29	+ 29	—	—	5	+ 5
„ *Italy*	9	+ 9	4	+ 4	2	+ 2
„ *U.S.A.*	36	+ 36	—	—	—	—
Portable tools & appliances & small domestic devices not over 15 kg.	71*	+ 28	17*	+ 3	36*	+ 9
Elec. appliances for motor vehicles, cycles and i.c. engines	106	+ 10	63	+ 9	55	+ 27
From U.K.	59	+ 7	51	+ 21	46	+ 29
„ *Canada*	13	+ 7	—	—	—	—
„ *Australia*	4	− 1	1	+ 1	—	—
„ *U.S.A.*	9	+ 2	1	+ 1	—	− 2
„ *W. Germany*	14	+ 3	4	− 8	6	+ 1
Torches complete or excluding batteries and bulbs	17	− 1	8	− 3	14	+ 1
From U.K.	3	+ 2	1	—	1	—
„ *Hongkong*	12	− 4	6	− 4	11	—
Other appliances and apparatus	255	+ 112	132	+ 26	154	+ 35
Parts and accessories, unspec.	180	+ 34	131	+ 43	54	− 7

* Mainly from U.K.

CONTRACT INFORMATION

Accepted Tenders and Prospective Electrical Work

CONTRACTS OPEN

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Australia. — MELBOURNE. — 4th February. Posts and Telegraphs Department. Motor generator sets. (E.S.B. 12723/53. Ten/7900.)* 9th February. Power rectifiers. (E.S.B. 12722/53. Ten/7901.)*

Bath.—26th January. Town Council. Electrical installations in dwellings at Snow Hill. Town clerk.

Belfast.—29th January. Electricity Department. Electrical stores. (See this issue.)

5th March. Two 60 MW turbo-alternator feed heating and condensing plant sets, two 72,000 kVA generator transformers, and steam, feed, drain and exhaust piping, etc. (See this issue.)

Canada.—WINNIPEG.—25th January. City Council. 5 kV switchgear for sub-station duty. (E.S.B. 12958/53. Ten/7895.)*

Coseley.—18th January. U.D.C. Street lighting equipment. (See this issue.)

Edinburgh.—North of Scotland Hydro-Electric Board. Lighting, heating and auxiliary cabling installation at Luichart Dam. (See this issue.)

Hendon.—30th January. Corporation. Street lighting equipment. (See this issue.)

India.—NEW DELHI.—12th January. Director General of Supplies and Disposals. Electric cables and cable boxes. (E.S.B. 12991/53. Ten/7909.)*

ANDHRA.—15th January. Government Electricity Department. Six 1,000 kVA, 11 kV voltage regulators (E.S.B. 12975/53. Ten/7912.)*

London. — WESTMINSTER. — 25th January. City Council. Lamps and motor vehicle batteries for one year from 1st April next. Town clerk, Westminster City Hall, London, W.C.2.

Minehead.—10th February. U.D.C. Supply and erection of 20 steel columns with 3/80 W fluorescent lanterns, ancillary equipment and wiring for the lighting of Park Street, The Parade and The Avenue. K. G. Holman, surveyor, Blenheim Road.

New Zealand.—WELLINGTON.—17th February. Post and Telegraph Department. Capacitors and condensers. (E.S.B. 12497/53. Ten/7868.)*

Paignton.—12th January. U.D.C. Street lighting equipment. Surveyor, Municipal Offices, Oldway.

Salford.—29th January. City Council. Electric centrifugal boiler feed pump at Blackfriars Public Baths. General superintendent, Administrative Offices, Blackfriars Public Baths.

South Africa.—JOHANNESBURG.—14th January. Stores Department, S.A. Railways. Submersible electric pumps, each of 14,000 to 15,000 gal/hr, against a total head of 330ft. (E.S.B. 12682/53. Ten/7876.)*

21st January. Union Tender and Supplies Board. X-ray equipment. (E.S.B. 12687/53. Ten/7882.)*

United States.—DENVER, COLORADO.—Department of Interior, Bureau of Reclamation. Two 69 kV instrument transformers. (E.S.B. 12543/53. Ten/7897.)*

Worcester.—21st January. City and County Fire Brigade Committee. Batteries Chief fire officer, Copenhagen Street.

ORDERS PLACED

Brampton (Cumberland). — Parish Council. Street lighting installation (£3,500).—Metrovick.

Cowdenbeath. — Corporation. Improved lighting scheme on trunk road between the burgh boundaries at Perth Road and Broad Street (£4,531).—G.E.C.

Isle of Ely.—Electrical installation at Westwood County Junior School, March (£1,698).—W. Palmer & Son (March).

Lockerbie.—Corporation. Accepted. Conversion of street lighting from gas to electricity (£2,518).—S.W. Scotland Electricity Board.

Ormskirk.—U.D.C. Accepted. Street lighting on the county road from the town end roundabout to Burscough Road and from Pippin Street to Square Lane (£8,164).—G.E.C.

WORK IN PROSPECT

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Abertillery.—Houses on site "B" at Swffryd, Crumlin; G. H. Davies & Hurley, architects to U.D.C., 12, Cross Street, Abergavenny.

Ashton-under-Lyne.—Houses (128), 56 flats and 40 bungalows for aged persons; borough engineer.

Barnack (Northants).—Houses in Barnack Road for R.D.C.; F. J. Lenton & Partners, Broad Street, Stamford, Lincs.

Bathgate.—Houses (100), with electrical work; burgh surveyor, Bathgate, West Lothian.

Bingley.—Extensions to Limefield Mills (£25,000); S. Jerome & Sons, dress goods manufacturers.

Birmingham.—Extensions to premises for Harrisons (Birmingham), Ltd., Bradford Street Works; Harrison & Cox, Ltd., architects, 49, Frederick Street, Edgbaston, Birmingham.

R.C. secondary school, City Road area; S. N. Cooke & Partners, architects, 34, Harborne Road, Edgbaston, Birmingham.

Flats (210) at Kitsland Road, Shard End, and temporary welfare centres and houses for district nurses on several sites (£100,470); A. G. Sheppard Fidler, city architect, Civic Centre.

Bradford. — Residential wing and assembly hall at the Margaret McMillan Memorial Training College (£85,000); W. H. Leathem, town clerk, Town Hall.

Houses (430), Parkside Road; city architect.

Bristol.—Factory on the Bedminster estate; Dove Bros. (Bristol), Ltd., bag manufacturers and wholesale stationers, St. Thomas Street.

Calne.—Houses (34), Bryan's Close; Geo. Brown & Partners, architects, Unity House, College Green, Bristol.

Cardiff.—Shops and maisonnettes on sites at North Llanishen, Llanrumney and Fairwater; city surveyor, City Hall.

Cardiganshire.—Old people's home at Pendre, Cardigan, and conversions at Highmead Mansions, Llanybyther, to form special school; G. R. Bruce, county architect, County Hall, Aberayron.

Carlisle.—Extensions at Cumberland Infirmary for Regional Hospital Board; S. L. Jack, architect, 35, Warwick Street.

Beer bottling and mineral water factory, Durranhill estate, for Batey & Son, Brampton; Johnston & Wright, architects, 13, Castle Street.

Chester.—Houses (150); borough surveyor.

Cockermouth.—Flats, Sullart Street; U.D.C. surveyor, Council Offices.

Darwen.—Flats, Lower Wood Bank (32), Redvers Road (28) and Snape Street (12); borough surveyor, Town Hall.

Daventry.—Houses at Brauston Road estate (38) and proposed new slipper baths at the town centre; borough engineer.

Deal.—Rebuilding of pier; Sir William Halcrow & Partners, consulting engineers, Alliance House, Caxton Street, S.W.1.

Durham. — Additions to Finchale Abbey training centre; S. W. Milburn & Partners, architects, 9, Esplanade, Sunderland.

Edinburgh.—Offices on Frederick Street corner site for Sun Insurance Office, Ltd. (£100,000); T. W. Marwick, architect, 7, St. Colme Street.

Essex.—Police station and court house at Harlow, and police station, houses and garages at Station Lane, Hornchurch; H. Conolly, county architect, Chelmsford.

Eston.—Grammar school (£103,166); G. Fordy & Son, Ltd., Boathouse Lane, Stockton-on-Tees.

Fence Houses (Co. Durham).—Factory for N. Hyer, Ltd.; William Holford, architect, 80, Bedford Street, Liverpool, 7.

* Specifications may be inspected at the Export Services Branch, Board of Trade, Lacon House, Theobald's Road, London, W.C.1 (Chancery 4411; extension 769).

Great Yarmouth.—Infants' and junior school, Gorleston; F. Jackson, architect, 22, Euston Road.

Halifax.—Crematorium at Park Wood; borough engineer, Crossley Street.

Hartlepool.—Additions to the Pallister Works (£150,000) for Steetley Co., Ltd.

Hatfield.—Development for housing of areas A, C and D at South End; chief engineer, Development Corporation, New Town House, St. Albans Road, Hatfield.

Hemel Hempstead.—T.A. centre (£40,000); Hertfordshire T. & A.F. Association, London Road, Hertford.

Horsham.—Houses (400); Davis Estates, Ltd., 346/350, Kilburn High Road, London, N.W.6.

Houghton-le-Spring.—Bank premises, Newbottle Street, for Sunderland Trustee Savings Bank; Newrick & Blackbell, architects, 58, John Street, Sunderland.

Houses (220), The Burn; U.D.C. surveyor.

Huddersfield.—County school, Bradley; borough architect, High Street Buildings.

Isle of Wight.—Secondary modern school at Upper Ventnor (£151,930); F. H. Booth, county architect, County Hall, Newport, I.W.

Keighley.—Extensions at Limefield Mills, Crossflats; S. Jerome & Son (Holdings), Ltd.

Houses (170), Braithwaite estate; borough architect.

Kirkby.—School clinic; county architect, Preston.

Leeds.—Occupational centre, Stanningley (£40,479); Wm. Airey & Sons, Ltd., Eldon House, Leeds.

Leigh.—Bus station at King Street; borough engineer.

Liverpool.—Large new garage premises at 39, Commercial Road, for British American Tobacco Co., Ltd.; Wm. L. Lowe & Partners, architects, 3, Eberle Street, Liverpool.

London. — CHELSEA. — Rebuilding Chenil Studios (£20,000); town clerk, Town Hall, King's Road, S.W.3.

GREENWICH.—Flats and maisonnettes on sites at 380–394, Woolwich Road, S.E.7, and 22–28, Tuskar Street, S.E.10; town clerk, Town Hall, Greenwich High Road, S.E.10.

Manchester.—Residential nursery at Longley Lane (£35,000); city architect.

Margate.—Three-storey block of flats, Crow Hill estate; W. L. Armstrong, borough surveyor, 38, Grosvenor Place.

Matlock.—Extensions to Whitworth Hospital, Darley Dale; Sheffield Regional Hospital Board, Fulwood House, Fulwood Road, Sheffield.

Newcastle - under - Lyme. — Branch library at Clayton; borough engineer and surveyor.

Newport (Mon.).—Development of Craig Park estate for housing; E. A. Middle, borough engineer, Civic Centre.

Northampton.—Secondary modern school, Cherry Orchard; H. A. Skerrett, chief education officer, Springfield, Cliftonville, Northampton.

Northwich.—Houses (20), Rudheath and Shurlock estates; Scott & Clarke.

Ongar.—Shops with two-storey dwellings over, Shelley estate; R.D.C. surveyor, Chipping Ongar, Essex.

Ossett. — Houses (40), Kingsway, Dimple Wells Road and Headlands Road; B. Freeman, town clerk, Town Hall.

Otley.—Development of site for housing at Milner Bank; U.D.C. surveyor, North Parade Offices.

Oxford. — Multi-storey flats, Wood Farm estate; city architect.

Penistone.—Extensions to Grammar School; Enthoven & Mock, architects, 4, Raymonds Buildings, Gray's Inn, London, W.C.1.

Penrith.—Church hall at Seagill for Rev. F. Ward, Wesley Manse; A. Knewstubb, architect, St. Andrews Chambers.

Penzance.—Ambulance Depot, Alverton Road; S. E. Gregson, architect, County Hall, Truro.

Prudhoe-on-Tyne.—Bungalows (15), Oaklands, for U.D.C.; J. M. Angus, architect, 21, Lovaine Place, Newcastle-on-Tyne.

Salford.—Extensions at the technical college; county architect, Preston.

Scarborough.—Flats or bungalows on three sites; H. V. Overfield, borough engineer.

Southport. — Dwellings (255) and shops, Radnor Drive site; borough architect.

Spalding.—Outpatients', physiotherapy and maternity departments at Johnson Hospital, for Sheffield Regional Hospital Board; Norman Webster & Son, architects to the Board, Station Street, Spalding.

Stanley (Co. Durham).—Houses (60), Catchgate; U.D.C. surveyor, Council Offices.

Stourbridge.—Outpatients' and casualty department, Corbett Hospital; D. A. Goldfinch, architect to the Birmingham Regional Hospital Board, Augustus Road, Birmingham.

Sudbury (Suffolk). — Two-storey addition to High School for Girls; West Suffolk county architect, Westgate Street Offices, Bury St. Edmunds.

Sutton Coldfield.—Factory extensions, Mere Green Road; J. Lucas, Ltd., Great King Street, Birmingham, 19.

Torquay.—Extensions to Marine Spa Ballroom; P. W. Ladmore, borough surveyor, Town Hall.

Wakefield.—Secondary bilateral school, Thornes House; city engineer, Town Hall.

Wallasey.—Extensions to the Victoria Central Hospital (£100,000); architect to the Liverpool Regional Hospital Board, Premier Buildings, Church Street, Liverpool, 1.

Development of two housing sites at Moreton; borough surveyor, Town Hall.

Warmley (Glos.).—County school, Cadbury Heath; county architect, Shire Hall, Gloucester.

West Hartlepool. — Four-storey maisonnettes in the central area; Kingsley and Phillips, quantity surveyors, Lambton House, Lambton Road, Newcastle-on-Tyne.

Whitby.—Police station (£43,000); H. J. Knowles, county architect, County Hall, Northallerton.

Woking.—Houses (56), Barnsbury Farm site; U.D.C. surveyor.

Wortley.—Houses (46), 48 flats and 12 bungalows, Lane End, Chapeltown, for R.D.C.; Husband & Co., consultants, 388, Glossop Road, Sheffield, 10.

East Midlands Consultative Council

WHEN the East Midlands Electricity Consultative Council met at Nottingham on 30th December a welcome was extended to a new member, Major H. E. Knight, M.I.E.E., of Geddington, Kettering. Major Knight is electrical engineer in charge of the Tube Works Section of Stewart & Lloyds, Corby, and is a past chairman of the East Midland Centre of the Institution of Electrical Engineers.

Following the Council's action in asking all housing authorities in the area to co-operate in providing adequate wiring facilities it had been reported at the previous meeting that the majority of authorities were allowing their tenants freedom of choice. Three local authorities, however, had indicated that although they were anxious to give tenants of their houses such electrical services as they desired, they could not do so at present owing to inadequacy or lack of electricity supplies. This matter was discussed with representatives of the Area Board and the position in the areas covered by two other local authorities which had subsequently notified the Council that freedom of choice was not available to their tenants was also examined. The Council had been assured that supplies would be given or improved in certain localities as soon as practicable. In other cases where freedom of choice was not available discussions had been initiated between local authority representatives and the Board.

During a discussion on rural electrification, Mr. C. R. King, the chairman of the Board, assured the Council that the Board was fully aware of the need to give supplies to farm cottages as well as farms in order to arrest the present trend of farm workers leaving the land due to lack of amenities in their houses.

Mr. King informed the Council that while, up to October, the sales of electricity had increased by approximately 10 per cent over the corresponding period of last year, the rate of increase for November had fallen to 0·9 per cent compared with November, 1952. This position had arisen because of the relatively mild weather. The Board's optimistic forecast of sales during 1953–54 was, therefore, unlikely to be realized.

In addition to the reports of progress and development during September—October, showing that 225 farms and 8,612 other consumers had been connected, the Council also gave consideration to 145 new schemes already approved by the Board for reinforcing or extending the mains. These included supplies to no fewer than 4,792 new houses and 441 farms and other rural premises, the total amount of capital expenditure involved being approximately £1,096,800.